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A NEW FIELD FOR EXPLOITATION

BY
F. H. KITTO



DEPARTMENT OF THE INTERIOR
CANADA

HON. CHARLES STEWART
MINISTER

W. W. CORY, C.M.G.
DEPUTY MINISTER

NATURAL RESOURCES INTELLIGENCE BRANCH
F.C.C. LYNCH, Superintendent

In addition to its printed publication of economic facts relating to Canada, *The Natural Resources Intelligence Service* will obtain for you specific information regarding the country's resources and opportunities for their development.

CENTRAL BRITISH COLUMBIA CANADA

A New Field for Exploitation

BY

F. H. KITTO, D.L.S., M.E.I.C.

(SECOND EDITION, REVISED)

Prepared under the direction of the Superintendent
Natural Resources Intelligence Branch

DEPARTMENT OF THE INTERIOR, CANADA

Hon. Charles Stewart, *Minister*

W. W. Cory, C.M.G., *Deputy Minister*

1922

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MAP

Map of Central British Columbia, Canada, scale 35 miles to 1 inch. . . Inside back cover.



TOPOGRAPHICAL

British Columbia is Canada's most westerly province, comprising all the Pacific seaboard belonging to the Dominion, together with many coastal islands and an extensive inland territory. For many years it had the largest area of any province in Canada and now holds third place, being exceeded by Quebec and Ontario only. Its total area is 355,855 square miles, of which 353,416 square miles are land and 2,439 square miles are covered by water.

British Columbia is the mountain province of Canada. Almost its entire area is made up of gigantic ranges, whose majestic peaks, clothed in perpetual ice and snow, rival in magnitude and beauty the famous Alps themselves; of deep, narrow valleys of exceeding fertility, where luscious fruits and luxuriant vegetation, watered by foaming mountain streams and sheltered by overhanging cliffs, attain a degree of perfection unequalled elsewhere; or of broad, sunny plateaus of grassy lands, interspersed with numerous lakes and streams, bordered by gently-rolling hills of greenest woods and drained by networks of swiftly-flowing streams. The province is a veritable "sea of mountains," and its grandeur of scenery, congenial climate and wealth of natural resources are unsurpassed by any other district of equal magnitude in the world.

From east to west Canada is made up of five great physiographic divisions, namely, the Appalachian region, embracing the Maritime Provinces and Eastern Quebec, the St. Lawrence lowlands of Southern Quebec and Ontario, the Great Plains region of Western Canada, the Laurentian plateau surrounding Hudson bay, and the Cordilleran region extending from the Rocky mountains to the Pacific coast. The greater part of British Columbia lies within the Cordilleran division, with a triangular area in the northeast corner of the province extending into the Great Plains division. The outstanding topographical feature of the province is the Rocky Mountain range, the "backbone" of the North American continent. It crosses Canada in a north-westerly and southeasterly direction and makes the "continental divide" that parts the waters of the Pacific slope from those flowing easterly.

The Rocky mountains vary in elevation from 2,700 feet in the vicinity of Dease lake to a climax of 13,068 feet in mount Robson. Pine pass has an elevation of 2,850 feet, Yellowhead pass 3,700 feet and Kicking Horse pass 5,332 feet. There are several peaks exceeding 10,000 feet in elevation and innumerable lesser mountains, hills and plateaus. It has been estimated that if the whole of British Columbia were brought to a level plane the elevation would be about 3,500 feet above the level of the sea.

The Rocky Mountain range runs practically parallel to the Pacific coast at a distance of 350 or 400 miles inland. A lesser and more irregular range follows the coast more closely and constitutes what is known as the "Cascade" and "Coast" mountains. Between these two principal mountain ranges lies a vast plateau.

The Cordilleran division thus subdivides itself naturally into these three great belts, the Eastern, Central and Pacific. The Eastern belt is comprised of the Rocky Mountain system, and may be considered, generally speaking, as a mountainous

region. The Western belt includes the Pacific system, made up mainly of the Coast and Cascade mountains, and the Insular system, comprised of a series of islands running parallel to the coast, of which the main one is Vancouver. This belt is also a mountainous one, though not so pronounced as the Eastern belt. The great Central belt, however, containing some more or less independently defined systems of lower mountains and plateaus, constitutes on the whole a vast area of land suitable for agricultural exploitation and settlement.

The northeast part of the province, lying east of the Rocky Mountain system, falls within the Great Plains division of Canada. These plains include the prairies of Western Canada and constitute the agricultural areas of Manitoba, Saskatchewan, and Alberta. The part of British Columbia included in them lies partly in the famous Peace River district and partly in the drainage basin of the Liard river. The Peace river portion of British Columbia and the middle part of the Central belt contain the bulk of the agricultural lands of the province.

British Columbia extends from the straits of Juan de Fuca and the 49th parallel of north latitude, which constitute the international boundary between Canada and the United States in these parts, northerly through 11 degrees of latitude to the 60th parallel, beyond which lies the Yukon territory. To the east lies the province of Alberta. The summit of the Rocky Mountain range is the interprovincial boundary as far north as its intersection with the 120th degree of west longitude, which is then the boundary for the remaining distance. Westerly the province extends to the Pacific ocean except in the northwest corner where the "pan-handle" of Alaska intervenes. Vancouver island and the Queen Charlotte group of islands, together with many smaller ones, also form part of the province.

The northeast part of the province, lying in the Great Plains division, forms part of the Great Mackenzie basin. Two principal rivers flow through this section, the Peace and Liard. The Peace reaches the Mackenzie by way of the Slave river and Great Slave lake and the Liard joins it directly.

The southeast part of the province is drained by the Columbia and its numerous tributaries southerly over the international boundary line and thence to the Pacific.

The southern and central interior is drained by the great Fraser and its principal tributaries, the Nechako and Thompson rivers, to tide-water at Vancouver. Along the western coast the principal rivers are the Skeena, reaching the sea at Prince Rupert, the Nass, flowing into Portland inlet, and the Stikine which cuts through the Alaskan pan-handle to reach the sea near Wrangel.

Central British Columbia is an indefinite term. It is usually used to designate the great interior plateau lands, comprising the famous Bulkley valley, Nechako valley, Upper Fraser river drainage basin and the Cariboo and Chilcotin districts. It is sometimes applied to the country served by the Grand Trunk Pacific railway. The scope of this report is intended to apply to all these districts. For such purposes arbitrary boundaries have been adopted, though not adhered to strictly. In general terms, therefore, it may be here defined as that part of the mainland lying between the 52nd and 57th parallels of north latitude, and comprising a total area of approximately 145,000 square miles.

This portion of British Columbia is most interesting and unique in its development. To the business man of the day it is a "New British Columbia"—made

accessible only upon the completion of the Grand Trunk Pacific railway in 1914, held for a still further period from commercial exploitation by the Great War, and now requiring the completion of the Pacific Great Eastern railway and the establishment of transpacific shipping lines from Prince Rupert to enable its development to be prosecuted in a thorough manner. To the historian, however, it is the "Old British Columbia," explored and occupied previous to any other mainland part of the province.

Fur trading and gold mining blazed the way for the occupation and settlement of British Columbia, and the fields of these earliest activities lay in this, the central part of the province. Fort MacLeod, on MacLeod lake, has the distinction of being British Columbia's earliest establishment and dates back to 1805. It is thirty-eight years older than the capital, Victoria. Fort St. James, on Stuart lake, and Fort George, at the confluence of the Fraser and Nechako rivers, were established in 1806 and 1807, and were thus also over a quarter of a century old when the Hudson's Bay Company established a post on the site of the present capital city. Prince Rupert is the newest sea port on the coast, yet Fort Nass, at the mouth of the Skeena, and later Fort Simpson (now Port Simpson) were important coast ports before the days of either Victoria or Vancouver.

Alexander Mackenzie, the first white man to reach the Pacific overland, travelled across the province and back again entirely within this central belt in the year 1793. Over one hundred years ago trade routes by canoe and trail were well established throughout this district. The Skeena and Nass rivers on the coast, the Fraser, Nechako and Stuart in the interior, and the Parsnip, Finlay and Peace flowing easterly were well travelled avenues of trade, while the Yellowhead pass had witnessed a century of travel by foot before the first train rushed through.

Original surveys for the Canadian Pacific railway led through this pass, and, had they been adhered to, conditions would have been reversed with respect to the southern and the central parts of the province. The building of this transcontinental railway brought in an influx of workers and settlers along its route which, unfortunately for the central districts, was located well to the south and crossed the Rockies by the Kicking Horse pass. About the Pacific terminal of this great road has grown up the city of Vancouver, and for nearly fifty years the benefit of this railway has been in favour of the development of the more southerly parts of the province.

The building of the Grand Trunk Pacific railway, however, which takes the route of the Yellowhead pass, Fraser, Nechako, Bulkley and Skeena rivers to meet the coast at the newer city of Prince Rupert, brought to the central belt upon its completion in 1914 the advantages that the more southerly parts received by the completion of the Canadian Pacific railway in 1885.

No sooner had this transcontinental railway been completed than the great European war broke out, thus practically paralyzing the expected development along its route and holding in abeyance for five or six years longer the settlement of its adjacent territory.

Possibly there may be advantages in these circumstances. As a result of the war Canada finds herself burdened with a heavy debt and facing a serious problem in the re-establishment of a large army of men. The raising of funds with which to meet her obligations and the finding of homes for thousands of men present a

tremendous task. The solution lies in the development of her immense natural resources and in the absorbing of the returned soldiers in connection therewith. There arises the question of location. Where are the resources that lie dormant to be found? Where are homes available for the thousands of disbanded soldiers?

The answer, to a large extent, lies in Central British Columbia. Here we have an immense territory of which the potential wealth in natural resources is beyond estimate and where conditions for home-making are of the best. The areas of arable agricultural lands are in the neighbourhood of ten million acres, with additional land suitable for grazing purposes. The belt is highly mineralized and no one can foretell what extent of treasure lies buried beneath its hills. The coast and inland waters are rich in fisheries, the extent and value of which are beginning to be more fully realized. The forests are also most extensive and the lumbering and pulp industries are already well under way. Water-powers are numerous and great. The climate is agreeable. In fact conditions are exceedingly inviting for intensive settlement and development along agricultural and industrial lines.

The handicap of lack of transportation that has held back this district is now fast disappearing. One great transcontinental railway, the Grand Trunk Pacific, traverses the belt midway from east to west; another, the Canadian National, runs through its southeastern corner, while the Pacific Great Eastern is building to cross-cut the belt from south to north. Towns are springing up along these lines. Mines are being opened up, saw and pulp mills erected, water-powers harnessed, fishing fleets added to, and an era of development is fast getting under way.

Here, then, lies a new field, vast and fruitful, tested and proven, rich and bountiful in nature's gifts, offering wealth and homes to thousands of willing workers who seek a fair chance to attain success.

It is not only an inviting country, from a business standpoint, offering prospects of liberal and speedy financial gains, but it is a pleasant country in which to make one's home. Men do not come alone to Central British Columbia, intending to wrest a fortune in a few frenzied years from its coffers, then to go to a more congenial spot on the earth's surface and enjoy with their families the fruits of their hardships. They come with their families to make attractive homes, to settle down and enjoy the beauties and advantages of the country as they progress in their various undertakings, and to lay the foundations for the happiness and prosperity of succeeding generations.

The Government of the province is anxious to see the district settled and its resources developed by a good class of people. Every possible encouragement is being offered with this end in view. The natural attractions and advantages of the district, together with the lively interest manifested by the Government in its development, assures the new comer of a start under the most promising conditions.



West coast of British Columbia. Pulp and paper plant at Ocean Falls.



West coast of British Columbia. Grand Trunk Pacific coast steamer navigating
"inside passage."

HISTORICAL

For those whose interest in the evolution and advancement of this western province looks into the past as well as into the future the pages of its early history contain many fascinating chapters. Unlike the eastern colony—the original Canada—that was acquired by conquest, the province of British Columbia has been British from the earliest days of the white man's occupation. Only the faintest suggestion of other claims were ever put forth, and they were disposed of before any serious progress had been made. The capital city of Victoria, founded and built up by British subjects only, laid out and patterned after English models, and with a climate very similar to that of England itself, is without exception the most ultra-English centre to be found in Canada to-day.

The long chain of events, commencing when European powers blindly struck out for unknown possibilities in the Pacific ocean, leading through the race for establishment of claims to new lands in which Great Britain planted two colonies, the one on Vancouver island and the other on the main coast, and culminating in the amalgamation and final confederation of these colonies with the great westward growing Dominion of Canada, constitutes a drama of colonial history second in interest to none. Separated, as it were, from the newly-found continent of America by apparently endless plains and impassable mountains, and bordering on an unknown ocean, the districts west of the Rocky mountains were, to all intents and purposes, in the early days a world of their own. Until finally drawn together by the process of expansion from either extreme and the elimination of the vast unknown intervening spaces, the histories of Eastern and Western Canada are those of unrelated colonies.

Following the discovery of America, Spanish navigators, Spain then being the great naval power of the world, soon found their way around the Horn and into the Pacific ocean, which they declared a "closed sea" to all other powers. The curtain rose on English activities in these seas near the close of the sixteenth century, when the bold sea-rover Francis Drake, in his famous ship the *Golden Hind*, had the audacity to beard the lion in his den by rounding the Horn and bravely sailing north into these forbidden waters. Taking the Spanish completely by surprise he attacked, captured and looted treasure ship after treasure ship and loaded his own vessel to the gunwales with treasure. Before sailing homeward he landed at a point on the coast, somewhere north of the present site of San Francisco, and claimed the territory in the name of the Sovereign, calling it "New Albion." Returning to England he was knighted by Queen Elizabeth for these exploits.

Wars and other matters of state prevented Drake's discoveries from being followed up, and, as far as the English were concerned, the curtain fell for some 200 years. Meanwhile the Spanish, reduced by the loss of their Armada to an inferior sea power, pursued, with the assistance of native Mexicans, a dogged policy of exploration northward along the Pacific coast. Between the years 1587 and 1592 they explored beyond Drake's "New Albion," and discovered, what they believed to be, a passage leading to the Atlantic, which they named Juan de Fuca strait, after a Greek pilot in their

employ by that name. A reflection of this alleged discovery is found in the annals of English discovery when, in 1660, the famous navigator Henry Hudson, in his little ship *Discovery*, searching for this mythical passage, entered the bay that bears his name and perished in his attempt to solve it.

It was not until the eighteenth century that discoveries on the Pacific coast began to take definite form. In 1728-29 Vitus Behring, a Dane, exploring for the Russian Government, sailed north through the strait that now bears his name, thus proving a passage from the Pacific, not to the Atlantic, but to the Arctic. In 1741, in company with Chirikoff, he discovered Alaska and took possession of it for the Russians.

The year 1778 witnessed the return of British explorers, when Capt. James Cook, searching still for the "northwest passage," landed at Nootka, on Vancouver island. The closing years of this century saw the race for national supremacy in these regions in full swing. Between 1774 and 1779 Spanish and Mexican explorers were particularly active on the coast. In 1787 Admiral La Perouse led a French expedition into these waters. The following year the United States of America, the new nation of the new world, despatched a ship to the scene.

English and Spanish claims on Vancouver island threatened for a time to lead to trouble, but were finally settled by the Nootka Convention of 1790, in which Spain gave up her claims at this port to the English. In 1792 Narvez, a Spanish pilot, discovered the mouth of the Fraser river, and the same year Capt. Gray discovered the Columbia and took possession of it for the United States. Meanwhile Capt. Vancouver was exploring in the vicinity of Puget sound and, had it not been for the presence of heavy fogs, would have anticipated Gray by a couple of weeks, having passed the mouth of the Columbia without seeing it.

The French did not follow up any discoveries on this coast, and the Spanish, through lack of ships, withdrew to the more southerly shores. The close of the eighteenth century saw the Russians holding Alaska and the coast from Sitka north, the English practically established from that point as far south as Puget sound and disputing with the Americans the possession of these regions, and the Americans and Spanish holding the southern coast.

The British claim to the great interior, however, was made secure when, in 1793, Alexander Mackenzie, a partner of the great Northwest Company, a rival of the Hudson's Bay Company for the fur trade, ascended the Peace river and its southerly branch the Parsnip, crossed to the Fraser and, after following it for some distance below its confluence with the Nechako, turned west and made his way to the waters of the Pacific, which he reached at Bella Coola. This great feat solved the mystery of the hidden lands beyond the mountains, opened up the way for the extension of the fur trade and the occupation of the coast districts, and established beyond question the British claim to these lands. For his great service to the Empire Mackenzie was knighted.

The period of discovery closes with the eighteenth century and the period of exploration and occupation commences with the nineteenth. Overland and by sea the rush to the new land began. The Northwest Company lost no time in taking advantage of the new field. Fort MacLeod was established in 1805, Fort St. James and Fort Fraser in 1806, and Fort George in 1807. In 1808, Simon Fraser made his famous descent of the Fraser river.

Meanwhile the Americans had not been idle. To secure full advantage of Capt. Gray's discovery of the Columbia an overland expedition under Captains Lewis and Clark was despatched. It reached the lower Columbia in 1805. In 1810 the Pacific Fur Company was founded by Astor, and in the following year a post, Astoria, was established by this company. The same year, 1811, another famous Canadian explorer of the Northwest Company, David Thompson, traced the erratic Columbia from its source to the sea. On reaching the lower waters of the river he found the newly-erected fort of Astoria.

The newly-formed and inexperienced Pacific Fur Company failed to make a success of its undertaking and in 1813, after two years of futile struggle, gave up and sold out to the Northwest Company. War having broken out between Great Britain and the United States, a British warship sailed into the mouth of the Columbia and claimed possession of the district by right of conquest.

The only post having thus been purchased, and the lands claimed under conquest, it would appear that the British claims to a region extending as far south as [Drake's "New Albion" might have been considered legitimate. However, at the close of the war of 1812-14, all confiscated territory was returned to the original holders, and, further, by the Oregon Agreement of 1813 it was agreed that a "joint occupancy" of this territory should be permitted.

In 1821 the Northwest and Hudson's Bay Companies united under the name of Hudson's Bay Company, and the prosecution of the trade in this territory was carried on with redoubled energy. Their trade extended southerly over a vast territory, including the present states of Washington, Oregon and Idaho. The great territory virtually belonged to this powerful British company. A flood of American land-seekers, however, soon found their way over the mountains and demanded that the control of these lands be vested in their Government. In 1846, after twenty-eight years of dispute under the joint occupancy agreement, the Oregon Treaty was passed, fixing the 49th parallel of latitude as the southern boundary of British possessions on the mainland.

This led to the withdrawal of the Hudson's Bay Company from active operation on the lower Columbia river. In 1843 Victoria was founded by James Douglas, under the instruction of the Hudson's Bay chief factor, John McLoughlin. Meanwhile Fort Vancouver had been established in 1825, Fort Nass in 1830, and Fort Simpson (later called Port Simpson) in 1834, to which the headquarters for the Nass and Skeena districts were transferred from Fort Nass. Victoria became the headquarters for the British territory lying west of the Rocky mountains and the Hudson's Bay Company constituted its entire government.

In 1849 there occurred the great gold discoveries of California and the consequent rush of thousands to these regions. In order to forestall possible complications, the British Government the same year declared Vancouver island a Crown colony. Victoria was made the capital and the island was turned over to the Hudson's Bay Company for colonization purposes for a period of ten years. Richard Blanchard was sent out as first governor in 1850, but finding no colony, apart from the fur traders themselves, and being governor in name only, he retired the following year and James Douglas, the then chief factor of the company, succeeded him.

In the years 1856-58 extensive discoveries of gold were made on the Fraser river. Anticipating a rush of miners to these regions, and wishing to be prepared to cope properly with the situation that would arise, the British Government declared the mainland a Crown colony in 1858. It was given the name of British Columbia, and James Douglas was made governor of both colonies. The rights of the Hudson's Bay Company on Vancouver island, granted in 1849, were terminated by purchase. This same year, 1858, the rights of the company to exclusive trading privileges on the mainland, which at the amalgamation of 1821, had been granted for a period of twenty-one years and renewed in 1833 for a further period of twenty years, expired.

This date then, 1858, may be taken as the closing of the reign of the great fur company and the real commencement of colonial government. In 1866, the two colonies were united, and Governor Douglas retired from active partnership in the Hudson's Bay Company to devote all his time to affairs of state. As governor he filled the office and performed the arduous duties attached to it in those early days in a most capable manner and for such signal service was knighted. His is a most outstanding figure in British Columbia's early development.

Five years later the colony of British Columbia, which had now, through the rush to its interior gold fields, attained a population of some 10,000 whites, cast in her lot with the Dominion of Canada, joining Confederation in 1871.

In 1858 the present boundaries of the province were decided upon in so far as internal arrangements in British possessions were concerned. In 1867 Alaska was purchased from Russia by the United States, and in 1871 the Washington Treaty settled the Alaska-British Columbia boundary.

By the agreement upon which British Columbia joined the Confederation it was stipulated that she should be connected by a transcontinental railway with the older provinces. This was accomplished by the completion of the Canadian Pacific railway in 1885. The population has grown from a total of about 36,000 in 1871, of which only about 10,000 were whites and the rest Indians, to some 523,353 at the last Dominion census of 1921.

The representation of the province at the federal capital at Ottawa now consists of 6 members in the Senate and 13 in the House of Commons. The Provincial Government is made up of a Lieutenant-Governor and a Legislative Assembly consisting of 47 members. The Lieutenant-Governor now holding office is the Honourable Walter Cameron Nichol and the Premier of the province is the Honourable John Oliver.

In Central British Columbia, the belt of mainland lying between latitudes 52° and 57° north, lie some of the oldest and most historic scenes of interest. The history of the province is sometimes divided into three periods, the period of discovery, the period of exploration, and the period of occupation. The central belt holds a stirring place in the annals of all three. Three great discoveries hold an undying fame in provincial records—Cook, Vancouver, and Mackenzie. The two former are associated with naval discoveries along the coast, but in Alexander Mackenzie, the central belt has a discoverer of its own. From east to west he travelled across the breadth of the province and kept within this central belt. Entering by way of Peace river he blazed the way for further exploits past the spots where soon were to be erected under his

direction such historic posts as Fort St. John, Rocky Mountain House and Fort MacLeod. The Peace, Parsnip, Upper Fraser, Blackwater and Bella Coola rivers were his discoveries in 1793, thus establishing a claim to this belt that has never been disputed.

In the period of exploration this belt was one of the earliest districts to become well known. Prominent among explorers are the names of Simon Fraser and David Thompson, who, at an early date, roamed these districts at pleasure and pushed their explorations southwards from bases established here.

As for the period of occupation, Central British Columbia holds the lead on the mainland and, with the exception of Nootka, on Vancouver island. Fort St. John, Rocky Mountain House, Fort MacLeod, Fort St. James, Fort Fraser, Fort George and Quesnel were thriving centres of trade, with canoe brigades and pack trains going back and forth from one to the other, before Astoria, Vancouver or Victoria were dreamed of. Fort Nass and Fort (now Port) Simpson were sea ports of prime importance before an anchor was dropped in Esquimalt or Burrard inlet.

At the time of Confederation the real industrial center of the province was the Cariboo gold district, in which the magic city of Barkerville sprang up, and for a time became the Mecca of the great far west. The Cariboo, Omineca and Cassiar gold-fields led to the occupation of this region in advance of any of the present more thickly-settled districts of the province, while the fur trade of the northern interior, and the fish and seal trade of the coast regions about the mouth of the Skeena and Nass rivers, opened up avenues of commerce through its entire breadth.

Before the construction of the Canadian Pacific railway there was a well-established route of travel from east to west far to the north of its location. River steamers plied the Skeena from Port Essington to Hazelton. Pack trains and canoe brigades had networks of routes between the coast and Rocky mountain ranges. From these plateaus they found their way eastward through the Rockies, by the Peace, Yellowhead or other passes.

The evolution of the province is sometimes divided into three political periods, namely, the unorganized period, the colonial period and the Confederation period. In the latter period only has Central British Columbia fallen behind. Had the Canadian Pacific railway followed the route of the Yellowhead pass and Skeena river, and had old Fort Simpson, the seaport of early days, been chosen as capital of the united colonies, what a difference there would have been.

Central British Columbia is not a new country by any means. It is the old country of the Pacific slope. Unlike the eastern provinces, where development spread from the earliest points of discovery and occupation, the development of British Columbia has been in an inverse order. The great central belt of longest historic interest has been pushed into the background through force of circumstances and is now just bursting forth into its own.

CLIMATE

The climate of Central British Columbia may be said, in general terms, to be moderate or very temperate. It has a considerable yearly range, and varies from west to east in fairly well defined belts paralleling the coast line and the Rocky mountains. These belts correspond closely to the topographical features of the country, and may be roughly defined under four headings, namely, the Coastal belt, the Interior Plateau belt, the Rocky Mountain belt and the Great Plains belt. The Interior belt, in the southern part of the province, is divided into wet and dry sections, but the dry portion extends in a very limited degree into Central British Columbia and may be omitted in considering the climate of this area.

The Coastal belt comprises that part lying west of the summit of the Coast range of mountains. It has the mildest climate of the four belts, also the heaviest precipitation. The mild climate is due mainly to the warm Japan ocean current, which flows southerly along the coast and exerts a moderating influence somewhat similar to that of the famous Gulf Stream of the Atlantic ocean. The westerly winds of the Pacific liberate most of their moisture before crossing the high, cold peaks of the Coast mountains, and thus give a very heavy rainfall in this belt. The proximity of the ocean, with the moderating influence of its body of water, tends to maintain a uniform and minimum range of daily variation in the temperature. The range between summer and winter temperature is also small. Summer days seldom rise above 80 degrees Fahrenheit, while the winters are comparatively mild, zero weather being an exception.

The greater part of the precipitation of the Coast belt is in the form of rain, except in the higher altitudes of the mountains, where snow can be seen at any time of the year. The snowfall is nevertheless heavy, as the total yearly precipitation amounts to about 100 inches on an average. In reckoning the total precipitation it is the practice to consider ten inches of snow equal to one inch of rain.

On page 18 a table shows a summary of temperature and precipitation records of the year 1918 obtained by the Meteorological Service of Canada at twelve stations situated in various parts of Central British Columbia. Three of these are coast stations, namely, Anyox, Prince Rupert and Bella Coola, while a fourth, Terrace, lies in the Skeena valley in the heart of the Coast mountains. It will be observed, by a reference to this table, that the coast stations show a heavy precipitation, that of Prince Rupert amounting to 93.42 inches, Anyox 85.10, Bella Coola 58.01, and Terrace 46.89. The average yearly precipitation is somewhat higher, that of Prince Rupert being about 107 inches. On the immediate coast more rain and snow falls than in the districts lying at the heads of inlets and in the river valleys nearer the mountains. In January of 1918 Anyox had some 48 inches of snow and Prince Rupert only 4, but the combined rainfall and snowfall of the one was almost equal to that of the other. Bella Coola has an average yearly rainfall of about 36 inches and a snowfall of about 54 inches. In the Naas valley the rainfall and snowfall are both heavier. At Terrace both rain and snow are less. Zero weather is seldom encountered in the coast regions. At Terrace the weather is

seldom colder than 5 degrees below zero. The snow varies here from 2 to 3 feet deep and lies on the ground from November till April. Though there are frequent and heavy falls of rain and snow the weather on the whole is agreeable, and includes many long spells of exceptionally cheerful days.

The Interior belt has an average elevation of over 2,000 feet, which gives it a lighter barometric pressure than prevails in the coast district. The precipitation is small; in parts of the Chilcotin country and south of Soda creek in the Fraser valley it is insufficient for the requirements of ordinary agriculture. At Chilcotin meteorological station the total fall for the year of 1918 was only about 8 inches.

In the great Nechako and Fraser plateaus the average annual precipitation is about 15 inches, or a little more. This is about the same as prevails in the great grain-growing sections of the Prairie Provinces, and has been found sufficient when careful methods of farming are followed. Though irrigation may be resorted to with advantage in certain localities, on the whole the moisture of this great district is sufficient for the production of all ordinary fruits, vegetables, grains and grasses common to districts of corresponding latitude throughout the west.

In this central belt there is a wider range in both daily and yearly temperatures. The days are remarkably warm and bright and the nights are cool. Summer temperatures sometimes reach as high as 95 or 100, while during short cold snaps in the winter the thermometer may fall to about 50 degrees below zero. For the year 1918 New Hazelton experienced temperatures varying from 93 above to 21 below, Vanderhoof from 94 to 50 below, Prince George from 88 to 54 below, Fort St. James from 92 to 45 below, Quesnel from 100 to 21 below, and Chilcotin from 91 to 30 below. Spells of either hot or cold weather are usually of short duration only. The coldest was that of 54 degrees below zero at Prince George, in January, but the average for that month at this station was 18 degrees—a very moderate winter month on the whole. The highest figure, 100, was recorded at Quesnel in July, but the average for the month was 64. This is also a very moderate average for a summer month. Both temperature and precipitation vary throughout the central interior according to altitude and latitude. The agriculture and grazing areas have, taken the year round, a climate very agreeable and favourable for the successful prosecution of mixed farming and ranching.

In the more mountainous parts, such as the Cariboo mining fields, the weather is colder, and there are much heavier falls of both rain and snow. Barkerville has an average of 19 inches of rain and 156 inches of snow. Its elevation, however, is over 4000 feet, and the district is not within the limits of the agricultural areas.

The winters, like those of the prairies, are cold and dry; the air is clear and crisp; the amount of sunshine prevailing is exceptionally great, and there are very few winds, thus giving a most pleasant season. The snowfall is medium, and, with an absence of winds, the snow does not drift to any extent. Excellent sleighing is thus enjoyed in these parts. From time to time the warm Pacific wind sweeps through the passes of the Coast range to the interior plateaus, giving days of balmy weather to interrupt the more severe periods of winter.

Summer frosts prevail in many localities throughout the central interior plateaus. They are not severe enough to interfere with the growing of fodder but do injure at times the grains and fruits. It is believed, however, that they will disappear as the

land is cleared up and drained. An important factor in stimulating the growth of all vegetation is the exceptional length of day that prevails in these latitudes during the summer season. A wonderful amount of sunshine is liberated between May and September.

In the Rocky Mountain belt the winters are fairly cold and the snowfall heavy in the higher altitudes. In the Rocky Mountain trench, paralleling the western base of this range, the climate is milder, with a range of temperature and an annual precipitation favourable for the development of the rich agricultural areas lying in it. It includes the valleys of the Canoe, South Fork of the Fraser, Parsnip and Finlay rivers.

In the Great Plains division lies the northeastern part of Central British Columbia, consisting of the upper part of the Peace River district. The climate here is very agreeable and remarkably moderate considering the latitude. The winters are dry and cold, except for short periods when affected by warm Chinook winds, but the snowfall is light and the air clear and bracing. Winds and storms are rare and the average temperature is not severe, though cold snaps sometimes occur, when the thermometer goes as low as 50 degrees below zero. The coldest record of the year 1918 was 48 below and the mean temperature for January, the coldest month, was 1 below. Winter weather may be expected in October, though open falls are by no means rare. There is seldom much severe weather before Christmas.

Spring comes early and quickly, and the summer seasons are pleasant, with long sunny days and short cool nights. In fact, for some three months there is almost continual daylight. The precipitation is light, averaging from 12 to 15 inches annually. It occurs, however, mostly in the form of rain during the growing months of June and July, and is sufficient to ensure successful crops of all classes of vegetables, grains and grasses.

Taken on the whole the climate of Central British Columbia may be termed mild to moderate, varying according to belts, latitude and altitude. It is pleasant, healthful and favourable for agricultural activities. There are no objectionable extremes of heat or cold, humidity or drought. Violent wind storms, hurricanes, blizzards and tornadoes are unknown, and such electric storms as occur are not of undue severity. Fogs and heavy cloudy weather prevail to a certain degree on the coast, but the amount of sunshine is surprisingly high.

Following is a table showing the highest, lowest and mean temperature records and the amount of precipitation for each month of the year 1918, at twelve representative points through Central British Columbia. Three of these, Anyox, Prince Rupert and Bella Coola, are on the coast, though their meteorological stations are located at points varying in elevation from 150 to 370 feet above sea level. A fourth, Terrace, is more inland, though its elevation is still low. It is on the Skeena river, in a gorge of the Coast mountains. It will be observed that the weather here not only becomes slightly colder but the range of temperature increases. The precipitation also is less.

In the interior plateau are New Hazelton, Vanderhoof, Prince George and Fort St. James, with Quesnel and Chilcotin lying farther south. Of these Quesnel and New Hazelton have the mildest climates, with Chilcotin somewhat colder and drier. The other stations are Cranberry Lake, well in the Rocky Mountain trench, on the

divide between Tête Jaune Cache and Canoe river, and Hudson Hope, in the Peace River district. The latitude, longitude, and elevation of each station is also shown in the table.

CENTRAL BRITISH COLUMBIA
TEMPERATURE AND PRECIPITATION, 1918

Station	Anyox				Prince Rupert				Bella Coola			
Latitude	55° 27' North				54° 18' North				52° 40' North			
Longitude	129° 48' West				130° 18' West				126° 54' West			
Elevation	370 feet				170 feet				150 feet			
1918 Month	Temperature			Precipitation	Temperature			Precipitation	Temperature			Precipitation
	High	Low	Mean		High	Low	Mean		High	Low	Mean	
January	40	3	29	10.06	54	20	38	10.92	45	8	32	7.24
February	36	5	26	9.97	50	14	33	5.66	42	10	28	6.96
March	42	3	29	8.36	50	11	35	9.13	46	5	32	7.26
April	64	18	39	3.42	57	26	41	4.86	75	24	43	0.63
May	72	33	46	3.77	66	34	45	7.13	76	31	49	1.78
June	77	40	55	1.59	72	36	52	4.75	81	32	55	1.95
July	90	44	61	2.45	81	44	58	5.09	88	—	—	4.88
August	80	49	58	5.78	78	48	56	8.38	80	42	59	3.78
September	79	39	58	1.85	79	42	55	2.20	85	34	61	0.23
October	59	32	43	17.18	63	34	48	14.64	64	26	47	7.46
November	48	22	34	8.59	60	28	40	10.20	52	26	37	5.83
December	38	11	29	12.08	47	24	36	10.61	43	19	33	10.01
Year	90	3	42.25	55.10	81	11	44.75	93.57	88	5	—	58.01

Station	Terrace				New Hazelton				Vanderhoof			
Latitude	54° 30' North				55° 15' North				54° 0' North			
Longitude	128° 30' West				127° 35' West				124° 0' West			
Elevation	223 feet				1,030 feet				2,093 feet			
1918 Month	Temperature			Precipitation	Temperature			Precipitation	Temperature			Precipitation
	High	Low	Mean		High	Low	Mean		High	Low	Mean	
January	52	3	30	6.27	43	-21	22	1.95	43	-50	12	3.02
February	49	3	25	5.69	41	-20	21	0.88	44	-38	10	1.79
March	47	-2	28	2.73	51	-15	28	1.18	54	-39	20	1.06
April	70	18	41	0.24	72	14	42	0.49	69	3	37	0.20
May	75	28	48	1.49	77	24	48	1.42	77	23	44	0.45
June	79	33	56	4.21	82	30	55	2.22	80	25	51	0.92
July	90	43	64	3.72	93	35	61	1.83	94	30	58	2.23
August	81	42	59	3.45	78	36	56	2.23	81	32	54	1.30
September	84	32	58	0.56	79	23	53	0.51	81	23	52	0.03
October	68	29	45	8.77	63	21	43	3.03	67	17	39	1.11
November				5.41	50	15	33	1.49	52	-4	29	0.69
December	42	10	30	4.35	42	-8	25	1.17	39	-23	17	1.80
Year	90	-2		46.89	93	-21	40.58	18.40	94	-50	35.25	14.60

CENTRAL BRITISH COLUMBIA—Continued

TEMPERATURE AND PRECIPITATION, 1918—Continued

Station	Prince George				Fort St. James				Quesnel			
Latitude	53° 55' North				54° 28' North				52° 59' North			
Longitude	122° 41' West				124° 12' West				122° 30' West			
Elevation	1,867 feet				2,280 feet				1,700 feet			
1918 Month	Temperature			Precipitation	Temperature			Precipitation	Temperature			Precipitation
	High	Low	Mean		High	Low	Mean		High	Low	Mean	
January.....	50	-54	18	3.86	45	-48	14	2.61	48	-21	21	4.11
February.....	46	-37	16	0.36	45	-38	11	1.22	48	-16	20	0.90
March.....	54	-35	26	1.74	51	-33	19	0.59	63	-17	30	0.45
April.....	74	9	41	0.06	64	6	35	0.15	79	15	44	.....
May.....	76	24	48	0.38	74	19	42	0.41	80	27	50	1.56
June.....	83	25	55	2.03	82	22	51	0.96	90	31	59	2.19
July.....	88	28	57	0.52	92	24	56	1.68	100	33	64	1.28
August.....	82	38	58	3.02	79	27	54	1.58	89	40	61	2.16
September.....	84	25	53	0.04	81	20	48	0.08	82	32	56	0.13
October.....	76	19	43	2.05	59	14	37	2.07	72	24	44	1.51
November.....	51	-3	30	0.61	50	-8	27	0.84	56	11	34	0.60
December.....	43	-15	22	1.30	40	-18	17	0.96	44	-7	23	0.80
Year.....	88	-54	38.92	15.97	92	-48	34.25	13.15	100	-21	42.17	.....

Station	Chileotin				Cranberry Lake				Hudson Hope			
Latitude	51° 40' North				52° 50' North				56° 05' North			
Longitude	123° 0' West				119° 20' West				121° 55' West			
Elevation	3,100 feet				2,460 feet				1,522 feet			
1918 Month	Temperature			Precipitation	Temperature			Precipitation	Temperature			Precipitation
	High	Low	Mean		High	Low	Mean		High	Low	Mean	
January.....	46	-30	17	1.45	42	-44	19	1.75	49	-48	-1	1.22
February.....	48	-21	16	0.15	40	-32	16	1.74	46	-44	6	1.12
March.....	56	-21	24	0.15	56	-33	27	2.22	49	-31	16	1.06
April.....	71	5	40	0.14	70	2	38	0.15	71	9	41	0.29
May.....	76	21	45	1.11	74	15	45	1.62	80	18	46	1.23
June.....	88	28	54	0.88	85	28	54	1.34	83	28	54	3.75
July.....	91	34	60	2.81	95	27	59	1.23	96	32	59	2.79
August.....	.....	.....	.....	.....	89	34	56	1.36	81	34	59	1.75
September.....	80	26	54	0.00	81	24	51	1.10	86	25	55	0.15
October.....	64	16	40	0.03	66	15	42	1.56	72	-1	35	1.22
November.....	53	-4	27	0.20	43	-6	29	1.14	55	-5	24	0.66
December.....	50	-22	19	1.00	40	-24	22	1.65	46	-25	16	0.45
Year.....	91	-30	.....	.....	95	-44	38.17	16.86	96	-48	34.17	15.69



Homestead at Fraser lake, British Columbia.



Field of potatoes on ranch at Fraser lake, British Columbia.

SOIL

As no comprehensive soil survey of Central British Columbia has yet been attempted the information available is of necessity of a more or less general character. Considerable information regarding the soils in various scattered localities is, however, given in the reports of surveyors or others especially interested in the agricultural possibilities of the region.

Much of Central British Columbia is mountainous, but large areas occur where the land is well adapted for agriculture. West of the Rocky mountains the arable soils may be divided into two groups, the one including the valley bottom and terrace soils, the other including the upland soils of the great central plateaus. East of the Rocky mountains the soil belongs to the Great Plains division of Western Canada.

The soils of the valley bottoms and lower terraces are mainly alluvial, or, as they are often called, river-made soils. These valley flats have been gradually built up by deposition of sediment from the flood-waters of the present streams. The lower terraces, or benches, which, in many places, border the sides of the valleys and rise one above the other, are also mainly alluvial in character, and represent the flood plains of the rivers when they flowed at higher levels. Through these extensive alluvial flats the rivers cut ever-changing channels, and on the portions built up above water level vegetation quickly acquires a foothold. The heaviest forests of British Columbia are found growing on these flats, and wherever soil of this nature occurs most luxuriant vegetation in greater or lesser form is found.

A marked feature of the alluvial soils is that they contain large quantities of vegetable or organic matter, included during the gradual process of formation of the soil. The presence of this organic matter, often to a depth of several feet, furnishes the soil with a vast store of humus and renders such soils highly fertile.

This soil is for the most part fine and silty, free from stones and exceedingly easy to till. It lends itself readily to irrigation and does not bake when drying out. It is usually black or chocolate coloured. In places where the soil is more sandy and contains little organic matter the colour is whitish or a light shade of brown or yellow. In some cases the presence of mineral matter produces more marked colouring, such as dull-red hues.

This class of soil is especially adapted to the growing of small fruits, garden truck of all kinds, flowers and generally such varieties as are associated with the most intensive methods of land cultivation.

The soils of the higher terraces bordering the river valleys somewhat resemble the alluvial soils of the lower terraces and valley bottoms. The higher terraces rise to a height of several hundred feet above the valley bottoms and in places extend for several miles from the streams. It is believed that a series of glacially dammed lakes occupied these valleys in prehistoric times. On disappearing they left a great deposit known as the white silts. This silt is found in places to a depth of 40 to 50 feet. Many of the higher terraces are formed from the erosion of these silts and are in places overlain by alluvium, hence the soils resemble those of the lower terraces and river bottom. Much of the soil in the Nechako and Fraser valleys is of this nature.

The upland soils of the great Central Plateau belt vary considerably, and on the whole are exceedingly rich. They are formed chiefly from glacial drift and vary in character according to variations in the materials comprising the drift. A large part of the soil is formed from boulder clay, and hence is somewhat clayey in character and is retentive of moisture. The surface soil, to a depth of several inches, is usually black, showing the presence of a good supply of humus.

Ridges of gravel and small boulders are occasionally found on the higher plateaus and some of the bench lands are stony. Many of the small tributary valleys are found to be sandy and stony, while lighter and gravelly soils cover many of the high benches and lower range of hills.

On some hillsides and low ridges or plateaus are found heavy clayey soils. Over certain areas fires have burnt off the humus from the surface soil, rendering it unproductive and difficult to till in its present condition. Such soils, when treated with a fair coating of fertilizer, rapidly regain their fertility and usually prove lasting.

The sandy, gravelly and stony soils, though not favourable for cultivation purposes, nevertheless produce great quantities of grass and herbage and are well adapted for grazing purposes.

The soils of the area east of the Rocky mountains are similar to the soils of the great plains region and are in part prairie soils. For the most part they are clayey in character and have a black surface soil of considerable depth, with a clay subsoil underlain by horizontal beds of shale and sand rock. One of the principal characteristics of this soil is its ability to retain moisture. This property enables it to force a luxuriant growth of vegetation even when the precipitation is light. Irrigation, therefore, is unnecessary in these sections, even though the rainfall only averages from 12 to 15 inches a year.

The prairie soils are also easy to till and do not bake following heavy rains. The surface soil is thin or lacking in very small areas, while on the contrary the black surface soil often extends to a depth of 3 feet or even more. The clay, of course, is found exposed along the cut banks and steep ravines approaching the foothills. Sandy and gravelly soils are found in limited areas only. There is no alkali and very little gumbo.

West of the Rocky mountains gumbo is found on some hillsides and cut banks. It has given more or less trouble on the grade of the Pacific Great Eastern about Quesnel and between Quesnel and Prince George. There is very little hard-pan in the central belt. Poor and rocky soils are found mainly at the higher altitudes, where climatic conditions are unfavourable for agriculture.

In general terms, it may be said that the arable soils of British Columbia are rich and easily worked, and are adapted to all classes of farming and fruit growing, according to the climatic conditions of the locality.

FORESTS

The forests of British Columbia harmonize with its mountains in their grandeur and extent. Here are found gigantic trees of rugged trunks and lofty heads, broadened and heightened by centuries of growth, that almost suggest an inspiration caught from the massive ranges and lofty peaks on the slopes of which they grow. Nature's works in these fields are on a scale of massive splendor and her forests fairly rival her mountains and valleys or her lakes and rivers in their wonderful proportions. Like stately sentinels they guard the deep silent valleys and clothe the massive rising mountain sides in luxuriant mantles of richest green. In perfect harmony with the wonderful physical characteristics of the great province they provide a background or setting to the picture presented, softening and smoothing the rugged lines and giving the finishing touches to make it one of the most beautiful and yet awe-inspiring scenes of the world.

The greatest single forest area in the world is that found on the Pacific slope of the North American continent. It is over 2,000 miles in length and extends in breadth from the Pacific ocean to the Rocky mountains. In this forest region are found some of the oldest and largest trees ever discovered. From them are secured timbers of the largest dimensions and strongest properties produced in the world. But not only in size and strength do these timbers excel. The clearness of the wood and the beauty of its grain are most remarkable, while the lasting quality of the fibre still further enhances its value. This great forest area contains over half the standing timber of the North American continent. The province of British Columbia occupies the north central portion of this great belt. Thus as an integral part of this, the world's greatest forest region, the forests of British Columbia may justly be regarded with admiration.

The economic value of these forests is in keeping with other great resources of the province. They are believed to contain about one-half of the saw material of the whole Dominion of Canada. The mild climate of the coast regions and the heavy precipitation which prevails there have resulted in producing, not only a prolific growth of trees of large size, but trees whose wood is unexcelled in clearness, strength and beauty. Though less in size, the trees of the interior parts of the province still maintain in goodly proportion the high standard of value that the woods of the coast are found to possess.

Four species in particular have made the forests of British Columbia famous. They are the Douglas fir, the western hemlock, the red cedar and the Sitka or silver spruce. The great age and size attained by these species and the value and beauty of their woods give them an undisputed rank among the famous trees of the world. In all some 48 species are found, of which 22 are coniferous (evergreen) and 26 deciduous. The trees of commercial value are nearly all coniferous. They comprise 16 species belonging to this class and one to the deciduous.

The Douglas fir (*Pseudotsuga mucronata*) is also known as the red fir, yellow fir, Oregon pine, Columbia pine and Douglas spruce. It is one of the most important timber trees in the world. In size it is surpassed only by the Sequoia of California. Its average height is 150 to 225 feet, with a diameter of 3 to 6 feet, but it sometimes attains a

height of 250 feet with a diameter up to 9 feet. Many growing trees are known to be over 500 years old, while some reach ages of 1,000 years before showing signs of decay. Its wood is the strongest wood in the world for its weight that is obtainable in commercial sizes and quantities. It is ideal for building and structural timber and increases in strength as it seasons. The enormous beams sawn from this wood are used in heavy construction all over the world. Its range of uses varies all the way from the heaviest to the lightest work, the beautiful grain of its wood making it most attractive for interior decoration purposes. Douglas fir reaches perfection on the southern part of the British Columbia mainland and on Vancouver island, but it is also found in considerable quantities throughout Central British Columbia.

Western hemlock (*Tsuga heterophylla*) is also known as gray fir, Alaska spruce, western hemlock fir, western hemlock spruce, hemlock spruce and Prince Albert fir. Four species of hemlock are found in North America, of which western hemlock is the largest and yields the best lumber. It grows from 125 to 150 feet high as a rule with a diameter of 2 to 5 feet but sometimes reaches greater proportions. The cool, moist climate of the coast is especially favourable to its growth, but it is found in Central British Columbia in the valleys of the South fork of the Fraser and the upper part of the Thompson. Its wood is light, fairly soft, strong, tough, straight-grained, not splintery, odorless and tasteless. It contains no pitch or resin and varies from light to reddish-brown in colour. It is easy to work, and finishes most beautifully. When stained and polished it is very handsome. The wood is also suitable for the manufacture of pulp and paper and the bark is rich in tannic acid.

Western red cedar (*Thuja plicata*) is also known as giant cedar, British Columbia cedar, Pacific red cedar, canoe cedar, western cedar and shingle cedar. Of the four true cedars, two of which are found in Asia and two in America, the western red species is by far the biggest and its wood the best. Its usual proportions are from 100 to 150 feet in height and 3 to 8 feet in diameter, but it sometimes reaches a height of 200 feet with a diameter of 15 feet. Its most remarkable characteristics are its durability and resistance to decay. The wood is exceptionally light, soft and of close, straight grain. It is easy to handle and work and is remarkably free from warping, shrinking or swelling. These qualities make it much in demand for uses where it will be exposed to dampness. It has thus become the greatest shingle wood of North America. It is also used extensively for exterior finish, light frame construction, piles, posts, poles, canoe and rowboat building, trellis work, fences, frames and sashes and generally in places where it will be exposed to the weather or the damp soil.

It is also widely used in the manufacture of moth-proof chests, drawers and boxes. Its rich brownish-red colour, exceeding lightness and faint pleasing aroma make it especially popular for such uses. It was these great cedars that the coast Indians used in the making of their huge war canoes and totem poles. They also used the inner fibres of the bark to make ropes, blankets and mats as well as thatches for their cabins.

The Sitka spruce (*Picea sitchensis*) is also called the giant spruce, silver spruce, tideland spruce and Alaska spruce. It is the largest species of the spruce family, of which some eighteen varieties are found in North America. It grows only on the Pacific coast and attains perfection along the coast of Central British Columbia and on Queen Charlotte islands. The average height of this tree is 150 feet, with a diameter of 4 feet, but it has been known to reach over 200 feet in height with a diameter up to 10 or 15 feet.

The wood is unusually clear and free from defects and can be obtained in large dimensions. It is even-grained, long-fibred, easily worked, non-resinous, odorless, tasteless, flexible and resonant. It does not warp or split and is strong and light. The colour is nearly white.

During the great war it was found that this wood excelled that of any other in the world for the construction of aeroplanes. Its unsurpassed qualities and abundant quantities were soon recognized and a large trade in this connection was quickly established with the Imperial Munitions Board. It is admirably adapted also for box and cooperage manufacture, especially when foodstuffs are to be encased. Its resonant qualities also fit it especially for the manufacture of piano sounding boards and stringed instruments.

In the forest of Central British Columbia are found nearly all the trees common to the great Pacific slope belt, except in those parts lying north of the Arctic-Pacific divide and east of the Rocky mountains. Excellent specimens of the four famous species referred to in the preceding paragraphs are found in these certain sections. The spruces, however, of which there are several species, comprise nearly half the available saw-mill material of this region and are the most widely distributed. Nearly nine-tenths of the total supply is made up of six principal varieties of trees, but there are some ten varieties in all that have an extensive supply of mill material. These principal species in the order of their extent are: spruce, red cedar, balsam, hemlock, lodgepole pine, Douglas fir, yellow cypress, cottonwood, yellow pine, and white pine. With the exception of the cottonwood they are all evergreens.

The spruce include four varieties, namely, Sitka, Engelmann, white and black. Sitka spruce grows on the coast only. The bulk of the spruce woods of Central British Columbia are composed of the white and Engelmann varieties, which are very similar to each other. Engelmann spruce is frequently called mountain, Rocky mountain or western white spruce. Black spruce is small and stunted, usually growing in cold wet lands; it is commonly called swamp spruce.

Only one species of cedar, the famous red, is found west of the prairies. It is confined to the coast and interior wet belt regions of British Columbia. The balsam or balsam fir is widely distributed throughout Central British Columbia. Its wood is largely used for the manufacture of pulp but when sawn into lumber makes a finished product of fair quality. Its winter buds are small, covered with resin and not pointed, while those of the Douglas fir are pointed and free from resin. Two species of hemlock occur, the great western and a small tree, the black or mountain hemlock.

The lodgepole pine, also known as black pine, scrub pine, shore pine and western jackpine, has a very large range, and is found in all parts of Central British Columbia. In dense stands, occurring in the eastern sections, it develops tall, straight trunks, but the coast trees are shorter and have branches extending all the way down the stem. Douglas fir grows to perfection on Vancouver island and the adjacent mainland coast, but is found in Central British Columbia throughout most of the areas drained by the Fraser, Nechako, Bella Coola and Canoe rivers. Its northern limit is approximately latitude 55.

The yellow cypress is confined to the coast districts. This tree is also commonly known as the yellow cedar, Alaskan cypress and the Nootka cypress. It grows in association with the Sitka spruce and western red cedar and is often mistaken for the cedar.

The cottonwoods belong to the poplar family, of which there are many species. The black cottonwood, otherwise known as the balsam cottonwood, balm cottonwood or western balm, is the only deciduous tree in British Columbia used to any extent in the manufacture of lumber. It grows to a large size and is found extensively along the rivers of Central British Columbia and the coast regions. Its wood is non-resinous and is used chiefly in cooperage and box making industries. The Indians use this tree extensively in making their "dugout" canoes.

Small quantities of yellow pine, also known as bull pine, are found in the south central districts of British Columbia. In the same regions are found also very limited quantities of white pine, sometimes known as silver pine. Both yellow and white pine make excellent lumber, similar to the fast disappearing pine woods of Eastern Canada.

Western larch and tamarack are found in small quantities and are used locally to some extent. Other evergreen trees found include the western yew and the Rocky mountain juniper.

Of deciduous trees the following species are found in the province: Garry oak, madrona, broad-leaved maple, vine maple, dwarf maple, aspen, balm of Gilead, black cottonwood, paper birch, western birch, Alaska birch, mountain birch, mountain alder, red alder, Sitka alder, white alder, Oregon crabapple, western service-berry, black cherry, black haw, western chokecherry, western dogwood, western black willow, long-leaved willow, Hooker willow and silky willow. The largest of these is the cottonwood.

In a recent report, entitled "Forests of British Columbia," prepared by H. N. Whitford, Ph.D., and R. D. Craig, F.E., under the direction of Clyde Leavitt, Chief Forester, Commission of Conservation, Canada, the estimated extent of the available saw-mill material of the province has been shown. These estimates were established only after a most exhaustive study of forest conditions in this province and may be considered substantially accurate. The following table, applicable to Central British Columbia, has been compiled from this source. It consists of two parts, the first showing the timber by districts and the second by species. For this purpose Central British Columbia will be found divided into four principal regions, coast, north central, south central, and east of Rocky mountains. Each of these regions is further subdivided into local districts and the total estimated amount of commercial timber shown for each district. In the second part of the table the estimated amounts of the various species of timber are shown for each of the four main regions.

CENTRAL BRITISH COLUMBIA

*ESTIMATED AMOUNT OF MERCHANTABLE TIMBER (BY DISTRICTS)

Region	District	M.B.F.	Total
South Central.....	Big Bend and Canoe river.....	6,266,000	
	Adams and Seymour.....	2,808,800	
	North Thompson.....	4,536,000	
	Bonaparte and Mahood.....	1,814,400	
	Bridge and Chilcotin.....	2,191,360	
	Nechako and Blackwater.....	4,478,400	
	Quesnel river.....	5,736,000	
	Willow and Bowron.....	7,761,600	
	Upper Fraser.....	10,420,800	46,013,360
North Central.....	Parsnip.....	7,382,500	
	Stuart, Salmon and Nation.....	6,959,600	
	Upper Skeena.....	10,140,400	
	Upper Nass.....	9,908,800	
	Finlay.....	3,518,400	37,909,700
East of Rocky Mountains.....	South Pine.....	6,625,200	
	Peace river block.....	4,545,000	
	North Pine and Halfway.....	134,400	11,304,600
Northern Mainland Coast.....	Smith and Rivers inlet.....	4,705,000	
	Burke and Dean channels.....	4,715,000	
	Gardner Canal.....	6,424,000	
	Skeena river to Portland Canal.....	7,131,120	22,975,120
	Total.....		118,202,780

CENTRAL BRITISH COLUMBIA

ESTIMATED AMOUNT OF MERCHANTABLE TIMBER (BY SPECIES)

Species	Region				Total
	South Central	North Central	East of Rocky Mts.	N. Main Coast	
	M.B.F.	M.B.F.	M.B.F.	M.B.F.	M.B.F.
Douglas fir.....	5,541,190	841,272		1,292,490	7,674,952
Red cedar.....	10,121,304	1,327,292		5,148,595	16,597,191
Hemlock.....	2,888,344	4,053,128		7,686,270	14,627,742
Balsam.....	4,206,442	7,195,936	331,260	3,117,835	14,851,473
Spruce.....	19,096,266	21,742,819	8,041,040	4,368,695	53,248,820
White pine.....	313,355				313,355
Lodgepole pine.....	3,379,643	2,647,849	2,932,300	1,680	8,961,472
Yellow pine.....	466,816				466,816
Cottonwood.....		101,404		457,020	558,424
Yellow cypress.....				902,525	902,535
	46,013,360	37,909,700	11,304,600	22,975,120	118,202,780

**"Forests of British Columbia," by H. N. Whitford, PhD., and R. D. Craig, F. E., Commission of Conservation, Ottawa, Canada.

This estimate shows a total of 118,202,780,000 board feet. A conservative figure, in round numbers, would be one hundred million of thousand board feet, including much of the best wood of the world. Not only is the present value to be considered but the future possibilities must be reckoned with. By a proper prevention of waste and an adequate fire protection, coupled with a policy of selective cutting and re-forestation, this source of supply should prove inexhaustible and permanent.

Naturally the lumbering industry has assumed great proportions in these districts. There are two principal centres or belts where this industry has centred. These are the coast regions, of which Prince Rupert is the centre, and the upper valley of the Fraser river, from Prince George eastward along the Grand Trunk Pacific railway as far as McBride. On the coast are found large and most modernly-equipped sawmills. Logs are cut and hauled out of the bush on specially constructed railways, rafted together and towed by powerful tugs to the mills, where they are cut into the required dimensions at marvellous rates of speed. These regions, on account of the numerous inlets and channels, make the wood most accessible, and the shipping facilities by land and sea to the widely-scattered markets of the world are of the best.

The interior mills are not so large, nevertheless their capacity ranges from 15,000 to 100,000 feet per day. Some 18 mills are located in this belt, and it is expected this number will shortly be increased to 25. The output for 1918 was nearly 30 million board feet. This was nearly all shipped east to the prairies.

Two huge pulp-mills operate on the coast, namely, the Pacific Mills Limited, at Ocean Falls, and the Whalen Pulp and Paper Mills, at Swanson Bay. The Ocean Falls plant represents an investment of over ten million dollars, and is a splendid example of a modern plant. Some 550 to 900 hands are employed, including many returned soldiers. News, wrapping and kraft papers are manufactured, the daily output being about 225 tons. A modern "company" town gives ample housing accommodation to the employees. At Swanson Bay a sulphite plant turns out about 30 tons of pulp daily. A sawmill is also run in connection with it.

Arrangements are under way for the manufacture of pulp at Prince Rupert and Prince George.

Almost unlimited quantities of pulpwood are available in these districts. Many other localities, both on the coast and in the interior, contain vast quantities of woods suitable for the manufacture of pulp and paper and the expansion of this industry may be expected. The total amount of pulpwood available in the whole province has been estimated at 225 million cords.

Many small local and portable mills are scattered all through the central belt. Outside the commercial lumbering areas there is a supply of wood sufficient to meet the requirements of the settlers and farmers for a long time. Wood for fuel and fencing is plentiful, while the ever-increasing mining industry finds a ready supply for timbering purposes. The noble forests of Central British Columbia are a source of never-failing admiration and an asset of inestimable value.



Seal Cove sawmill and Canadian Fish and Cold Storage Company's plant (rear view),
Prince Rupert, British Columbia.



Prince Rupert drydocks and shipbuilding yards. (Photographed on February 19, 1920.)

MINERALS

The mineral resources of British Columbia are most extensive and widely distributed and include many precious and base ores and non-metallic substances. The total production for all years up to and including 1920 shows a gross value of \$706,192,978, according to the estimate of the provincial Department of Mines. The largest item is represented by the coal and coke output, with some \$212,573,492 to its credit. Gold takes second place with a total output of \$178,698,026, and copper third amounting to \$161,513,864. The total amount of silver mined is quoted at \$53,668,284, lead at \$46,637,221, and zinc at \$19,896,466. The balance is made up of miscellaneous minerals, building stone, bricks and similar products, amounting to \$33,205,625.

In 1893 the total value of British Columbia's mineral output was only about three and a half million dollars, in 1897 it passed the ten million mark, and in 1901 the twenty million mark. The following three years fell short of this showing, but the output increased again and in 1907 was over twenty-five million. The years 1912 and 1913 each showed values over thirty million dollars, while 1916 proved the record, with over forty-two million dollars' worth of mineral production to its credit. The year 1917 fell behind by some five million dollars, but 1918 was again well up and almost equal to the great year of 1916. Except in the case of gold, the values of mineral products have been subject, especially in recent years, to fluctuations of considerable extent, so that comparative values of several years' output are not exact indications of their volumes, though generally speaking they serve to illustrate the rapid expansion of the mining industry of the province.

The quantities and values of mineral products for the whole province for the years 1918, 1919 and 1920 are shown on the following table:—

*QUANTITIES AND VALUES OF MINERAL PRODUCTS FOR 1918, 1919 AND 1920

	Customary Measure	1918		1919		1920	
		Quantity	Value	Quantity	Value	Quantity	Value
			\$		\$		\$
Gold placer	Ounces.	16,000	320,000	14,325	286,500	11,080	221,600
" lode	"	164,674	3,403,812	152,426	3,150,645	120,048	2,481,392
Silver	"	3,498,172	3,215,870	3,403,119	3,592,673	3,377,849	3,235,980
Copper	Pounds	61,483,754	15,113,449	42,459,339	7,939,896	44,887,676	7,832,899
Lead	"	43,899,661	2,928,107	29,475,968	1,526,855	39,331,218	2,816,115
Zinc	"	41,772,916	2,899,040	56,737,651	3,540,429	47,208,268	3,077,979
Coal	Tons, 2,210 lb.	2,302,245	11,511,225	2,267,541	11,337,705	2,595,125	12,975,625
Coke	" 2,210 "	188,967	1,322,769	91,138	637,966	67,792	474,544
Miscellaneous products			1,038,202	.....	1,283,644	.....	2,426,950
			41,782,474		33,296,313		35,543,084

*Annual Report of the Minister of Mines, Victoria, B.C., for the year ending December 31st, 1920.

The value of gold produced in these three years was \$9,863,949, of which \$9,035,849 was recovered from lode mining, leaving only \$828,100 as the product of the placer miner. Of the total output of gold from the early days to the end of 1920 \$75,044,203 is credited to the placer fields and \$102,753,823 to the quartz or lode claims.

The total production of copper, valued at \$61,513,864, exceeds by nearly sixty million dollars the production of lode gold, though the combined value of lode and placer gold holds first place in the metallies.

In the production of placer gold, Central British Columbia has occupied a most important position. The discovery of this alluring metal on the lower Fraser river and the consequent rush of miners, prospectors and fortune-seekers into the then unorganized interior led to the establishment of the Crown colony of British Columbia in 1858. The yield of placer gold in 1858 has been estimated at \$705,000, and for the ten succeeding years at \$28,823,198, an average of nearly three millions a year. The heaviest year was 1863, with \$3,913,563 to its credit.

The Cariboo gold-fields of Central British Columbia became the Mecca of an army of gold-seekers and a by-word in every civilized land. Creeks of abnormal richness were quickly washed out and many fortunes were amassed in a single season. This famous field, embracing an area of some 7,000 square miles, has produced about \$45,000,000 in gold, or over half the placer gold of the entire province. It still has an average annual output of about \$200,000. Barkerville is the centre of the field, with Quesnel the local distributing point from the Fraser river, and Prince George or Ashcroft the points of rail connection.

Another Central British Columbia gold-field that sprang into early prominence is the Omineca district, lying immediately north of the Arctic-Pacific divide. Production from this field was never as extensive, by any means, as from the Cariboo, nevertheless at one time it was the scene of great activity and many rich diggings were discovered. At present a few placer miners are working on various creeks, including Omineca, Manson and Nation rivers. The total output of the Omineca has been estimated at \$750,000, though exact records are not available.

Associated with the names of these two gold fields is also that of Cassiar. Cariboo, Omineca, and Cassiar were well-known names fifty years ago. The Cassiar district, however, centered more northerly and easterly, Telegraph Creek, on the Stikine river, being a favourite point of entry. The headwaters of the Skeena flow from these regions.

The lack of roads into these fields, the great distances to be traversed in order to reach them, the difficulties of transportation and the high cost of supplies, together with the crude and primitive mining methods employed decreed that only the richest and most easily worked claims could be mined at a profit. Hence when the cream of the district was taken off mining waned. The introduction of hydraulic mining has resulted in maintaining the industry where otherwise it would have almost died away and the bulk of gold recovered in the Cariboo district in recent years has been obtained by this process. Costs of operating, however, have advanced tremendously in recent years, while the gold value has remained stationary, so that the actual profits have been small.

The provincial Department of Mines has adopted a very active policy for furthering the mining industry. A district inspector and two resident engineers are permanently stationed in Central British Columbia, namely, Thos. J. Shenton, district inspector, at Prince Rupert, J. D. Galloway, resident engineer, at Hazelton, and Geo. A. Clothier, resident engineer, at Prince Rupert. Other geological and mining officials from the provincial Department of Mines, and several geologists from the federal Department of Mines at Ottawa have from year to year conducted investigations into

various localities throughout this belt. Recent work of this nature includes investigations of the Cariboo gold-fields by B. R. McKay, of the Fraser valley by L. Reinecke, of the northern interior by C. Camsell, of the Telkwa valley and vicinity by J. D. MacKenzie and of the westerly and coast regions by J. J. O'Neill, all of the Geological Survey of Canada, Ottawa. Reports of their findings are to be had on application to the Director. L. H. Cole and H. S. Spence, of the Mines Branch, Department of Mines, Ottawa, have reported on occurrences of salt and mica.

The reports of the resident engineers are to be found in the annual reports of the Provincial Minister of Mines. Wm. Fleet Robertson, provincial mineralogist and assayer, has also spent considerable time in this district. In 1919 J. C. Gwillim conducted investigations for the Provincial Government into the possibilities of oil production in the Peace River district of British Columbia. Further investigations of a similar nature were carried out in the same district in 1920 by J. A. Dresser and E. M. Spieker.

The province is divided into some forty-two mining divisions, each under the direct control of a gold commissioner and a mining recorder. The office for each division is located at a local point of greatest prominence, but for the convenience of miners sub-offices are established at various points throughout the division and are in charge of sub-recorders. Central British Columbia is practically included in the following eight divisions: Skeena, Nass River, Portland Canal, Bella Coola, Omineca, Peace River, Cariboo and Quesnel. The offices and various sub-offices for these eight divisions are shown on the following table:—

CENTRAL BRITISH COLUMBIA

*MINING DIVISIONS AND OFFICES, 1920

Mining Divisions	Location of Office	Location of Sub-office
Skeena	Prince Rupert	Alice Arm. Kitimat. Port Simpson. Swanson Bay. Copper City. Terrace. Stewart (Portland Canal).
Nass River Portland Canal Bella Coola	Anyox. Stewart. Prince Rupert	Bella Coola. Bella Bella. Ocean Falls. Fort Grahame. Fort St. James. Manson Creek. Telkwa. Fort St. John. Copper City. Terrace. Fort Fraser. Junction Finlay and Parsnip rivers. Pacific. Hazelton. Burns Lake. Houston. Usk.
Omineca	Smithers	Hudson Hope. Pouce Coupé. Quesnel. Fort George. McBride. Quesnel. Quesnel Forks. Barkerville.
Peace River	Fort St. John	
Cariboo	Barkerville	
Quesnel	150-Mile House	

* Report of the Minister of Mines, Victoria, B. C., 1920

Following the lead given by the placer mines of the Cariboo, prospectors, miners, geologists and mining engineers have spread over the entire central belt and in nearly every nook and corner minerals or traces of minerals to a greater or lesser degree have been found. The primitive methods of the early miners have been augmented by the most modern power, mechanical and chemical processes known. The coast districts have had the advantage of water transportation which has enabled them to forge ahead while the interior has been retarded through inability to get in heavy machinery or ship out quantities of ore. With the building of railroads and good wagon roads this handicap is being gradually removed.

On the coast the principal operations north of latitude 52 are at Anyox, where the Granby Consolidated Mining, Smelting and Power Company, Limited, operates a smelter and work the "Hidden Creek" group of copper claims. The company employs here from 1,200 to 1,500 men and smelted an average of about 2,200 tons of ore daily for the year 1920, exclusive of limestone and quartz used for fluxing purposes. The production for the year was approximately 25,404,950 pounds of copper, 9,330 ounces of gold and 439,806 ounces of silver. Power is derived from a 5,000 horse-power water plant augmented by steam plants during the winter when water is low. The town is "company" owned and consists of a very neat and substantial class of houses equipped with modern conveniences and reached by plank roads. The mines are about two miles distant from the smelter and connected by a narrow gauge railway.

Other important coast properties include the claims on Princess Royal island of the Belmont Surf Inlet Mines, Limited, from which 108,082 tons were mined in 1920, yielding 44,051 ounces of gold, 20,104 ounces of silver and 685,259 pounds of copper; the "Dolly Varden" mine, located 18 miles from the head of Alice Arm and connected by a newly constructed railway to tide-water, now shipping a rich grade of silver ore to the Granby smelter at Anyox; the "Drum-Lummon" copper mine, on Douglas channel, the "Premier" gold mine of Stewart; the "Ikeda" copper mine of Ikeda bay; the "Esperanza" group on Alice Arm; the "Golskiesh" mine of Anyox; the "Patterson" group of Porcher island, and many others with more or less development accomplished and exhibiting splendid prospects.

In the interior two mines are worthy of special mention, namely, the Rocher Déboulé and the Silver Standard, both located in the Hudson Bay mountain near Hazelton. The Rocher Déboulé is at present closed down pending more normal conditions. It shipped from April, 1915, to the end of 1918, and in this time produced 39,833 tons of ore containing 4,214 ounces of gold, 62,865 ounces of silver, and 5,746,306 pounds of copper.

The Silver Standard mine is situated about six miles from New Hazelton. It is a silver-lead-zinc property and during the year 1920 produced 4,000 tons of ore containing 218 ounces of gold, 103,020 ounces of silver, 189,488 pounds of lead and 453,512 pounds of zinc. A 50-ton concentrator was recently put into operation.

Actual lode mining in the interior is confined, almost entirely, to the Omineca mining division, though prospecting and development work on quartz claims are being carried on throughout all parts. Many promising gold, silver and copper claims are likely to prove good producers when normal conditions and better transportation facilities are available. It is believed the Cariboo district will not only increase its placer output but will also produce several quartz mills. Good showings are found

in extensive quartz bodies at Mt. Selwyn, near Finlay (Forks), and on Manson creek. In fact the localities that are already known to contain mineral deposits of promising value are too numerous to mention.

Coal is found in several localities throughout Central British Columbia. The Telkwa, Groundhog and Carben creek fields are the principal areas. Coal of a good quality is being mined and shipped from a point only $4\frac{1}{2}$ miles from the station of Telkwa, on the Grand Trunk Pacific railway. On Goat creek, a small tributary of Telkwa river, a seam 8 feet in thickness is exposed for several hundred feet. An average sample was found to have the following analysis: Moisture 0.06 per cent, volatile matter 33.9 per cent, fixed carbon 56 per cent and ash 9.5 per cent. As this field extends from $4\frac{1}{2}$ to 12 miles from the railway it is favourably situated as regards means of transportation and will likely develop quickly.

The Groundhog coal areas are not as accessible, but may be tapped by a line extending north from Hazelton or easterly from the head of Portland canal. They are believed to be very extensive and the coal of a splendid quality.

The Carben creek coal-fields are known to be quite extensive. The Carben is a tributary of Peace river, on its south side and a few miles above the head of Rocky mountain canyon on the eastern slope of the Rockies. Coal outcrops occur on small tributaries of Carben creek itself, and on Gethings creek, which enters the Peace nearer the canyon, and in the canyon itself. A sample from Gethings creek shows the following analysis: Moisture 1.6 per cent, ash 2.9 per cent, volatile matter 25.1 per cent, fixed carbon 70.4 per cent. It forms fair coke. These fields are at present without means of transportation, but should the Pacific Great Eastern or some other railway be built by the Hudson Hope route they will become very valuable.

Various outcrops of coal of more or less value have been found in many other sections. On the prairies such outcrops would immediately be investigated and the coal used locally as fuel if of sufficient value. Throughout Central British Columbia, however, the wood supply is still sufficient for local uses and only those coal areas which appear of considerable commercial value have been seriously considered. It is altogether likely that as the demand for this fuel increases and transportation facilities are extended the recovery of it will be greatly stimulated.

Mining is well established as a permanent industry and the presence of minerals in vast quantities is well known. Placer mining, the oldest of all branches of this industry, is reviving, and, with the introduction of hydraulic, drilling and dredging machinery, will develop on a large scale. The future of the Cariboo district depends on such works. Geologists who have investigated this field intimate that both placer and lode mining for gold may assume most important phases when railroad facilities are provided.

Work is being renewed on the Peace and in the Omineca districts. A gold dredge has recently been placed in Peace river at Fort St. John. Another may be placed on the same river above the canyon, where gold washing has been carried on by a small crew of men during recent years. The Inogenika river is being drilled by a company of Edmonton business men, who contemplate putting in a dredge if results warrant. As water-power is available almost everywhere throughout the placer districts, power for the operation of machinery or the pumping of water can be depended upon.

Strong saline springs were discovered in 1911 at Kwinitsa, a point on the Grand Trunk Pacific railway in the Skeena valley, 45 miles east of Prince Rupert. Drilling disclosed extensive beds of rock salt, at depths varying from 50 to 250 feet. Tests proved it to be pure and of the best quality. The presence of salt in close proximity to the centre of the fish industry is most advantageous.

Mica is found in the vicinity of Tête Jaune Cache and a few claims have been worked to a limited degree. A very fine, clear grade is procured, but the deposits are located in mountainous regions difficult of access. Muscovite also has been found in the Clearwater mountains north of Canim lake. Generally speaking, the exploratory stage has not been passed and the mica industry is only in its infancy. Gypsum is found in the Fraser valley south of latitude 52 and may possibly occur to the north also.

A promising prospect of molybdenite has been found in Timothy mountain, about 35 miles northeast of Lac la Hache. Near these molybdenite claims there is an occurrence of peridot, the precious form of olivine. When cut these stones make very fine gems. This is the only gem locality of commercial importance in Canada, but it is as yet undeveloped. Gold, silver and copper values have also been found in the same vicinity.

Outcrops of promising fireclay and infusorial earth are found in the vicinity of Quesnel. Building stones, sandstone, limestone, gravel, sand and brick clay are found in various places. Limestone for fluxing purposes at the Granby smelter is obtained from Swamp point on Portland canal. About 250 tons per day are produced. Hot mineral springs are found at the south end of Lakelse lake and in the Canoe River valley.

Platinum is found in various localities in Central British Columbia, especially in the Fraser and Peace drainage basins. It occurs in both solid rock and placers. In the early days its value was only a small fraction of what it is now and very few of the miners knew what the metal was or that it had any value at all. In fact thousands of ounces of this precious metal were actually thrown away by the placer miners of the early days.

Oil is believed to underlie large areas of Central British Columbia, and considerable interest has been shown in recent prospecting and drilling operations inaugurated with a view of locating it. Investigations for the Provincial Government have been undertaken by geologists in the Peace River District, while considerable drilling has been accomplished by the Imperial Oil Company in the vicinity of Pouce Coupé and Rolla. The oil rights on large areas of land in the Pouce Coupé district have been leased by speculators and future developments are being awaited with great interest. Drilling for oil is also being prosecuted near Burns lake.

The mineral occurrences of Central British Columbia are too numerous to mention. The few random references given serve only to illustrate the varied species and their wide distribution. The field is an attractive one for the prospector, miner and capitalist. The charming forests and lakes, with their bountiful supply of game and fish, lessen the hardships and privations of the prospector and make his lonely camp life more pleasant and prosperous. Miners' wages and housing conditions are very satisfactory, while the social and educational facilities, climate and living conditions in general are unsurpassed by any other mining district in the world. Investors and capitalists have a legitimate field here for active exploitation.

The mining laws of British Columbia are very liberal in their nature and compare favourably with those of any other part of the world. Individual free miner's certificates are issued good for one year upon payment of the sum of \$5. Provision in both the "Mineral" and "Placer-mining" Acts is made for the formation of mining partnerships, both of a general and limited liability character. A number of special Acts relating to mining have been passed by the provincial legislature during recent years.

The Mines Development Act provides for the expenditure of public money for the construction of trails, roads and bridges to facilitate the operation and development of mineral or placer claims or the exploration of new districts. The Mineral Survey and Development Act of 1917 provides for: (1) a mineral survey of the province, (2) certain aids to prospectors, (3) protection of wage-earners on mining works, and (4) protection of investors in mining property. The Iron Bounties Act of 1918 provided for the payment of a bounty on pig-iron manufactured within the province. The bounty is \$3 per ton (2,000 pounds), when the ore from which it is manufactured is mined within the province, and \$1.50 per ton otherwise. The Mineral Act Amendment Act of 1920 provides for the reservation by the Minister of Mines of areas containing iron ore and the disposal thereof by the Lieutenant-Governor in Council on such conditions as may be determined.

FISHERIES

In considering the fish resources of Central British Columbia it is well to bear in mind that these are not fixed in the same manner as its lands, forests, or mines. This applies particularly to the commercial species. The sockeye salmon of the Fraser river, for instance, is hatched in the spawning beds of the Fraser, of which Quesnel lake in Central British Columbia is one of the most important. The young fish then find their way to the ocean and reach maturity in salt water. Returning years later to the spawning grounds from which they started out they are caught by the fishermen of the lower Fraser waters and Juan de Fuca strait. The harvest, therefore, falls to the credit of the southern part of the province though the spawning grounds of the interior are a necessary and integral part of the great industry.

For this reason the fisheries of the entire province will be taken into account in the statistics given herewith. The asset is a movable one and no definite proportion can be allotted to any particular part of the province. The salmon must be permitted to reach their spawning grounds in the interior in order that the supply may be kept up for the fishermen of the coast regions about the mouths of the various rivers which the fish ascend.

Second only to the salmon in yield is the halibut. The halibut fishing industry centers at Prince Rupert and might be particularly claimed as belonging to the central part of the province.

The fisheries of British Columbia as a whole are more extensive and valuable than those of any other province of the Dominion. In 1917 they exceeded the combined output of Nova Scotia and New Brunswick. They also exceeded the output of the remaining six provinces collectively and represented more than one-third of the entire Canadian fisheries for the year. The value of the fisheries production of British Columbia has increased most rapidly. Records have been kept since the year 1876, when the total value of the fish catch was given as a trifle over one hundred thousand dollars. In 1880 it was nearly three-quarters of a million, while the following year it was double these figures. In 1888 it almost reached two million dollars, and the next year passed the three-million mark. In 1893 it reached beyond four million dollars, and 1897 beyond six millions. Values varied for some years but finally passed the ten-million mark in 1909, fell below the following year but reached thirteen millions in 1911 and in 1917 the remarkable figure of twenty-one and a half million dollars.

Statistics regarding the quantities and values of all fish and fish products marketed in British Columbia in 1917 and the capital equipment and number of employees are shown in the following tables. The information is taken from the Census of Industry, 1917, Part III, Fisheries Statistics, as published by the Dominion Bureau of Statistics. The report was prepared in collaboration with Dominion and Provincial Fisheries Departments and represents the most accurate and reliable information covering the subject.

BRITISH COLUMBIA

*QUANTITIES AND VALUES OF ALL FISH AND FISH PRODUCTS MARKETED, 1917

Kinds of Fish	Quantity		Value
			\$
Black cod, used fresh	73,164	cwt.	743,229
" green salted	386	"	4,338
" smoke	6,786	"	131,709
" dried	8	"	128
Brill	5,142	"	51,420
Clams and quahaugs, used fresh	5,992	brl.	35,952
" " canned	6,006	cases.	48,048
Dulse, crabs, cockles, etc	5,886	cwt.	48,424
Fertilizer	1,220	ton.	70,164
Fish oil	44,820	gal.	23,892
Flounders	2,679	cwt.	23,601
Fur seal skins	218	no.	6,540
Gill bone	510	cwt.	12,802
Gray fish, used fresh	11,200	"	4,480
Hake and cusk, used fresh	143	"	715
" " smoked	25	"	375
Hallibut, used fresh	113,285	qtl.	1,718,500
" smoked	122	"	2,512
Herring, used fresh	87,173	"	341,239
" canned	46,650	cases.	301,017
" smoked	6,263	cwt.	29,025
" dry-salted	161,865	"	328,721
" pickled	7,293	brl.	117,828
" used as bait	28,785	"	71,824
Mixed fish	1,648	"	13,184
Octopus	184	"	1,656
Oulachons	1,231	"	10,991
Oysters	1,789	brl.	32,202
Perch	492	cwt.	4,920
Pilchards, salted	200	brl.	2,000
" canned	1,090	cases.	9,810
Rock cod	1,086	cwt.	8,688
Salmon, used fresh	262,067	"	2,550,274
" canned	1,557,485	cases.	14,017,365
" smoked	1,418	cwt.	23,222
" dry-salted	12,670	"	125,979
" mild-cured	8,611	"	111,943
Salmon roe	1,564	"	7,820
Shad, used fresh	21	"	315
" salted	15	brl.	360
Skate	1,633	cwt.	10,117
Smelts	1,164	"	14,270
Soles	7,806	brl.	78,649
Sturgeon	445	cwt.	9,790
Trout	414	"	10,350
Whale bone and meal	291	ton.	10,185
Whale oil	436,995	gal.	342,247
Whiting, used fresh	345	cwt.	1,725
" smoked	100	"	1,000
Witches	5	"	50
Total value			21,518,595

*Season of Delivery, 1917.

Of the entire catch of 1917 nearly four-fifths were salmon, with a gross value of \$16,828,783. Halibut took second place with a value of \$1,721,012. Herring came third and were valued at \$1,192,654. Black cod accounted for \$879,404, clams and quahaugs for \$84,990, sole for \$78,649, and oysters for \$32,202. These seven divisions of the fishery resources produced \$20,816,701 out of the total of \$21,518,595 at which the catch of 1917 was marketed.

The share that should be credited to the coast and coast rivers of Central British Columbia, of which Prince Rupert is the centre of the industry, is shown on the

following table. The principal varieties of fish are five only, namely: salmon, halibut, herring, black cod, and soles. The subdivisions of this section are Skeena river, Prince Rupert, Rivers inlet, Naas river, North Coast and Queen Charlotte islands. The fishing waters of these subdivisions are tributary to Prince Rupert, thus bringing to Central British Columbia the benefit of the industry.

CENTRAL BRITISH COLUMBIA

*COMMERCIAL FISHERIES OF 1917

Fishing Districts	Salmon cwt.	Halibut cwt.	Herring cwt.	Black Cod cwt.	Soles cwt.
Skeena river.....	252,074				
Prince Rupert.....	25,746	62,879	19,900	13,271	5,717
Rivers inlet.....	80,053				
Naas river.....	100,375				
North coast.....	222,336	1,533	8,528	510	
Queen Charlotte islands.....	39,675		189		
Total quantity.....	720,259	64,412	28,617	13,781	5,717
Total value marketed.....	\$7,656,650	\$965,320	\$44,490	\$131,924	\$57,170
Grand total.....					\$8,855,554

*Census of Industry, 1917.

The great sockeye salmon packs of the Fraser, Skeena and Naas rivers have become famous in all parts of the world. Their habits form most interesting subjects of investigation. Though normally a salt water fish they ascend the rivers upon reaching maturity to spawn mostly in streams beyond the lakes of the interior.

The Fraser river spawning grounds include such large lakes as Harrison, Lillooet, Seton, Anderson, Chilko, and Quesnel. The Meziadin lake section is one of the principal spawning areas of the Naas river. Eggs are deposited and hatched in these interior lakes after which the parent fish die. The young fry, or fingerlings as they are called, find their way down stream to the ocean, where they spend some four years in reaching maturity. They then start on their long journey to the spawning beds from which they were hatched, their homing instincts being described as most highly developed. It is believed they actually are led by this instinct to the very waters of their origin.

In countless millions they battle their way up stream, crowding and hurrying forward as if driven by relentless foes. Seemingly inaccessible rapids and barriers are scaled by feats of wonderful jumping and swimming. Should impassable barriers halt their journey they accumulate in masses so thick that the waters appear packed full of them. It is said they do not rest or feed on these migrations, and many literally batter themselves to pieces in ascending rocky rapids.

Great losses to the salmon industry resulted from blocking their access to their spawning areas on the upper Fraser. A dam constructed in connection with mining activities across the outlet of Quesnel lake barred the entrance of fish for some time. Though the sockeye passed up the Quesnel river in millions, they could not enter the lake. Later a practical fishway was constructed to overcome the barrier. In 1909 over four million sockeye entered this lake, while in 1913, owing to a blockade in the Fraser canyon, caused by a slide of rock from the Canadian Northern

railway construction, only about half a million reached these spawning grounds. The run to Chilko lake was large in the years 1901, 1905 and 1909, but small in 1913 owing to the same blockade. The importance of keeping the way clear to these areas is therefore apparent.

The Meziadin lake section is now a favourite spawning ground for the Naas sockeye packs. Falls in the Meziadin form a natural barrier, but these are now overcome by a great fishway constructed by the Dominion Fisheries Branch. In the spawning season, during the spring and early summer months, these salmon push their way up the large rivers into the many lakes lying inland, and even ascend the smallest tributaries to every favourable body of water, however small, within reach.

Salmon are caught chiefly by gill-nets, seines and trap-nets operated from fleets of small fishing smacks. They are immediately taken to canneries constructed at convenient points all along the coast and put up for trade in tin cans, packed in wooden cases. Fishing may be conducted only under license, which must be obtained from the fisheries officials. The Dominion Government has established a number of hatcheries for the purpose of increasing this valuable species. Two are located in Central British Columbia, one being on Babine lake and one on the Skeena river. From these some 13,450,000 sockeye were hatched in 1917 and liberated in the Skeena watershed. There are some seven or eight additional salmon hatcheries in the more southerly parts of the province, and the total number of salmon fry produced in 1917 approached fifty million.

The halibut fishing industry of the Pacific coast adjacent to Prince Rupert has come into considerable prominence during the last few years and is of special interest to Central British Columbia. This industry is carried on in large, well-equipped steamers and vessels. The fish are captured by set lines or hand trawls, dories being used for setting and hauling the lines, as in the Atlantic deep-sea fishing. Herring are mainly used for bait, the supply of these fish being very plentiful in these waters.

The Pacific coast, with its numerous sheltering islands and deep inlets and fiords, affords most excellent fishing grounds of unusual protection. The length of this coast line, in British Columbia waters, exceeds 7,000 miles. Luxuriant forests clothe these shores, adding to the general pleasing effect.

At Prince Rupert during the height of the fishing season, about July, the "mosquito fleet," as it is called, comprised of fishing boats of an average value of about \$8,000 each, presents quite a busy scene. Canners are scattered at various points up and down the shore, but most of the halibut catch is shipped out in special trains. The Canadian Fish and Cold Storage Company, Limited, has a cold storage plant at Seal Cove of 14,000,000 pounds' capacity, now being increased by some 3,500,000 pounds. Fish are delivered from the "mosquito fleet" here and loaded into special refrigerator cars. Special "fish trains," made up of a number of these cars, leave Prince Rupert three or four times a week and rush through the province on their long run by way of Edmonton and Saskatoon to Winnipeg. They are there distributed, the bulk of the produce eventually finding a market in Chicago or eastern cities.

This great commercial industry is well established, and with proper control promises to be a permanent and profitable one for the district.

The following table shows a summary of the value of equipment and the number of persons engaged in connection with the fish industry in the whole province in 1917:—

BRITISH COLUMBIA FISH INDUSTRY

*EQUIPMENT AND EMPLOYEES, 1917

Equipment	Value
	\$
Seines, traps and smelt nets, etc.....	1,829,115
Hand lines, weirs, trawls, etc.....	103,681
Salmon and crab traps.....	15,700
Piers and wharves.....	504,047
Freezers, ice houses, whaling stations, salteries and crab and oyster establishments (approx.).....	2,152,505
Canneries and fish and smoke houses.....	12,749,476
Small fish and smoke houses (approx.).....	3,200
Vessels, tugs and carrying smacks (514).....	2,500,801
Boats, gasoline (3,172).....	1,837,820
“ sail and row (3,479).....	
Total capital.....	21,696,345

PERSONS EMPLOYED

Location	No.
In vessels, etc.....	* 1,589
“ boats.....	11,378
“ freezers, ice houses and whaling stations.....	292
“ canneries and fish and smoke houses.....	7,624
Total.....	20,883

*Census of Industry, 1917.

The total number of salmon canneries in British Columbia is given as 87 for the year 1917, with one whale oil factory and 21 fish and smoke houses.

While these figures are interesting as amplifying the wonderful extent and great value of the fishing resources of the province, they are of special value only to those concerned with the commercial side of the subject. The great majority of visitors, tourists or new settlers are more concerned with the sporting phase. Fishing for pleasure is a practice to which the majority of men who know little or nothing of the commercial phase are more or less addicted. To the lovers of both rod and gun Central British Columbia offers a field of unparalleled attractions. Fly-fishing of the very best awaits the angler throughout the length and breadth of this district in the many lakes and streams with which it abounds. Gamest of all game fish are found in the cool, rippling mountain streams of the interior and the crystal lakes nestling between towering ranges of snow-capped mountains.

Of the five species of salmon found in British Columbia only two will take a troll or fly. These are the “Spring” and the “Coho” salmon. The Spring or Tyee salmon is the largest and gamest of the salmon family. It is known in Oregon as the “Chinook” or the “Columbia,” in California as the “Quinnat,” and in Alaska as the “King” or “Tyee.” It takes the troll quite freely in salt water and occasionally rises to an artificial fly. These fish are caught in great numbers all along the coast

and vary in weight up to 60 pounds, with records as high as 70 pounds. The best months are from July to November. The Coho are even more numerous than the Spring, though smaller in size. They are considered equally game and may be taken as late in the year as October or November. The more southern waters are better known and more frequented by salmon anglers. Campbell river, on the eastern coast of Vancouver island, being a favourite rendezvous. The salmon rivers of the more northerly parts, including the Skeena and Naas, should prove equally attractive. When they become better known, Prince Rupert should prove the centre of tourist traffic connected with this branch of sport.

The trout of British Columbia comprise many species with great variation in colourings and markings. The steelhead trout closely resembles in habit, form and colour the salmon of Europe and is still sometimes classed as a Pacific salmon. Like the salmon, it spawns only in fresh water, but differs in that it survives and returns to the sea, where it remains until the following spawning season. In some of the larger lakes of the province it remains permanently in fresh water. This species weighs from four to twenty pounds, with exceptional weights as high as thirty pounds. Many anglers consider this the gamest fish taken in fresh water.

Numerous varieties of trout are found in all the rivers and lakes of Central British Columbia. The larger specimens found in the great lakes largely resemble the sea-run of the steelhead. The cut-throat and rainbow trout are also widely distributed. The many differences in colour, form and habit of these varieties lead to great numbers of names being applied to them, but by whatever name they are known they are none the less game.

Two very valuable species of charr are found. They are the "Dolly Varden," or "Bull trout," and a lake trout such as is found in Lakes Superior and Michigan. The Dolly Varden is found all through the mainland and on the coast; it is a very game fish, and ranges in weight from a few ounces up to thirty pounds, but species exceeding two pounds in weight are seldom taken with a fly. The larger ones freely take a troll. The lake trout are found in Quesnel and northern lakes. They are not fierce fighters, but are rated as the best of table fish found in the fresh waters of the province.

An enthusiastic holiday fisherman from New York, after hooking and landing three speckled beauties from a single cast with triple leaders in Lakelse lake, pronounced these waters the finest for trout fishing he had ever visited. All through the interior, however, such success may be obtained. The many lakes and lakelets, rivers and streams are most plentifully stocked with fish, and afford never failing sport for the ardent angler and a source of food supply for the settler.

Large sturgeon are caught with hook and bait in the lakes and rivers of the interior plateau. Whitefish are netted in great quantities in the more northerly streams and in Moberly lake east of the Rockies. In the Parsnip, Finlay and more northerly streams a fish locally called the "Arctic trout" is quite common.

Settlers and others coming to Central British Columbia will find great opportunities for recreation and profit in capturing the many varieties of beautiful and valuable game and commercial fish with which the widely distributed waters of the district abound. Government hatcheries are doing a good work in keeping up the supply, and this highly prized resource promises to be a most substantial and permanent one.



A glimpse of the Nechako valley near Vanderhoof.



Road leading from Vanderhoof north through the Nechako valley.

FUR AND GAME

The first white men to invade British Columbia were fur traders and the fur industry held unrivalled sway for fifty years. When Alexander Mackenzie, in 1793, ascended the Peace and Parsnip rivers and found his way through the Rockies and to the Pacific coast near Bella Coola he blazed the way for the occupation of Central British Columbia by outpost agents of the great fur company in which he held a position as partner, namely, the Northwest Company.

Early in the nineteenth century this progressive company pushed westward over the mountains and established a chain of posts in the interior. Fort MacLeod, erected in 1805, on the shores of MacLeod lake, soon became an important centre of trade. Fort St. James, Fort Fraser, Fort George and Quesnel quickly followed in line and the avenues of commerce that had halted for a time at the Athabaska or Saskatchewan were extended west of the Rockies.

The lure of furs brought their great rivals, the Hudson's Bay Company, to these new found fields. It also led to the formation of a new American enterprise, the Pacific Trading Company, which established the historic post of Astoria on the lower Columbia. The amalgamation of the two great Canadian companies in 1821, under the name of the older, the Hudson's Bay Company, and their purchase of the unsuccessful American interests, including Astoria, are matters of most interesting record. It was the visions of wealth to be derived from the furs of the sea otter and sea lion that spurred on the Russian explorers to the acquisition of Alaska and the valuable coast waters of these northern parts.

For fifty years the fur trade was carried on uninterrupted by other industries. The Hudson's Bay Company, with a staff of white traders and clerks and an army of native followers and hunters, reigned supreme in these regions and took their toll of wealth from every section of the mountains and valleys. Even when Vancouver island was declared in 1849 the Crown colony "New Caledonia," it was practically governed for years by this great fur company.

Then came the gold discoveries on the Fraser river and the great rush of miners into the interior in 1856, 1857, and 1858. A rival industry had come with an onrush that eclipsed the fur trade, and for a time pushed it almost into oblivion. Gold was the craze, and the interior districts of Cariboo, Omineca and Cassiar witnessed scenes of wildest excitement.

The gold boom brought numbers to the district and opened it up to the world at large. The fur traders no longer held a monopoly of the land. When mining waned other industries sprang up. The wealth of the forests, fisheries and lands was realized by the new comers, who saw in these regions unlimited resources and wonderful possibilities that the fur traders could not or would not admit.

Mining, lumbering, fishing, farming, shipbuilding and other industries have grown into prominence, but the fur trade that held lone sway for the first fifty years of the white man's occupation of these parts goes on apace. The mountainous nature of the province prohibits the settlement and cultivation of more than about ten per cent of its total land area, thus leaving vast regions of wilderness in which the wild animal and bird life propagate their species.

In the mountainous and sparsely settled districts of Central British Columbia are still to be found in great numbers practically every species of game and fur-bearing animal common to these regions since the earliest days. Large numbers of men still pursue trapping as their sole occupation, and, with the high price of furs that has prevailed in recent years, find it a very remunerative calling. Both game hunting and wing shooting may be enjoyed to the fullest extent in these parts.

The quality of furs obtained in Central British Columbia is the very highest. Marten compares favourably with the Russian sable, while fisher, lynx, foxes, and beaver are exceptionally good. Prince George is the centre of a great fur trade and the value of raw pelts shipped from this port in 1918 was approximately \$400,000.

The large game includes moose, wapiti or elk, cariboo, deer, mountain sheep, goats, bear, wolves and three species of the cat family. The smaller fur-bearing animals include black, silver and cross foxes, beaver, musk-rat, otter, raccoon, marten, mink, wolverine, badger, porcupine, hare, skunk, polecat, weasel, sea-lion, hair seal and a very few sea otter.

Moose are very plentiful throughout the interior and northern regions. The biggest and best heads are obtained in the Cassiar district which is best reached by way of the Stikine river. Prince George is also the centre of an excellent moose district. Along the upper Fraser and Parsnip rivers moose are very plentiful and have increased in numbers greatly during the last few years. Splendid heads are obtained from these districts. The grounds are easily accessible and hunting conditions are good. The district lying to the north and east of Prince George is exceptionally good.

The wapiti or elk were at one time quite numerous but are now exceedingly rare. They are now protected by a continuous close season in hopes that this noble species will not become extinct.

Cariboo are found in plenty. The Black or Mountain species are found in nearly all mountainous parts of the interior with the Chilcotin, Quesnel and Prince George districts favourable hunting grounds. In the more northerly parts big bands of the species known as Osborn's cariboo are found.

Mule deer and Richardson's or large black-tailed deer are widely spread over the more southerly parts of the district. The Columbia or Coast deer is plentiful along the coast but is not found east of the Coast range of mountains. The most common and widely found species of deer in Central British Columbia is the white-tailed species. These are found throughout all parts of the great interior plateaus.

Mountain sheep include four species, namely, the Common Bighorn, *Ovis Stonei*, *Ovis Tamini* and *Ovis Dalli* or Yukon sheep. The three latter species are very similar and are often found in the same band. The Bighorn is found in the more southerly parts, the Chilcotin district being a favourite range of theirs. The *Ovis Stonei* are the most numerous of mountain sheep and are particularly plentiful in the Cassiar district. The Yukon sheep are also widely distributed.

Mountain goats are very numerous all over the district where there are high mountains. They are found in the Coast mountains adjacent to the Grand Trunk Pacific railway and north and east of Prince George. They are also plentiful in the Omineca and Cassiar districts.

Grizzly bears are plentiful in the mountains and northerly parts of the district. The Naas, Skeena and Stikine rivers are said to afford good hunting for this ferocious

animal. Big game hunters will find in the grizzly a beast worthy of their highest admiration and one that affords the maximum of thrills. Black, brown and cinnamon bears are common all over the interior. During the salmon run they congregate along the rivers' edges and live on these fish, which they scoop out in a most dexterous style. To obtain good skins these animals should be hunted as soon as they leave their winter quarters. The fur then is thick and glossy and the colour good. In a short time it becomes faded and ragged as the bear scrambles through thickets of woods and tangles of berry bushes in the summer's heat.

Timber wolves are found in the northern parts and along the northern coast. They vary in colour from nearly black to grizzly grey, brown, or yellow. They prey heavily on cariboo, deer, smaller fur-bearing animals and the young of the large game. Coyotes or prairie wolves are fairly common throughout the interior. They will not attack man, but prey on poultry, birds and smaller fur-bearing animals.

Of the cat family some three species are to be found. The largest is the cougar, mountain lion or panther. While plentiful in the southern parts of the province and on Vancouver island, it is seldom found in the central parts. The common lynx may be found anywhere, while a few wild-cats are sometimes seen.

Of the smaller fur-bearing animals, there are many species widely distributed. Beaver are now being protected, as this very valuable animal was showing signs of being on the decrease. Indians are permitted to kill the beaver in summer-time if in need of food—a convenient excuse—and the practice no doubt has a more serious effect on the decrease of the species than the regular winter trapping.

Red foxes are plentiful, with a fair number of cross, silver and black scattered over the district. Fox farming is an industry that might prove very successful in many of the isolated valleys of the northern interior.

As approximately 90 per cent of the total area of the province will remain in its present condition of unbroken hills, covered with forests and interspersed with streams and lakes, the hunting grounds and haunts of these animals will remain undisturbed. So long as the taking of them is not permitted to become unduly excessive the fur supply should remain a permanent asset.

Of wild-fowl there is a large and varied list, which affords excellent sport in proper season and most palatable additions to the table. Geese and swans are found on the northerly interior waters, while many species of ducks are widely distributed over both coast and interior regions. On the coast they remain all winter, but migrate from interior waters.

Prairie chickens were scarce for some years, but after a period of protection they are becoming more plentiful. A few species of grouse are widely distributed and fairly plentiful. Ptarmigan are found in the mountain and northern regions in large flocks.

A number of game birds have been introduced from outside sources and are increasing in numbers satisfactorily. They include pheasants, European partridges and "Bob White" quail.

Game birds, birds of prey, song birds and insectivorous birds all abound plentifully in Central British Columbia. The wild life of the district is most prolific and affords the maximum of pleasure to the sportsman, naturalist and lover of nature.

WATER RESOURCES*

While only a small part of the greater watercourses of Central British Columbia have been investigated, there is no doubt that, as investigations proceed, the amount of power available will be found to compare favourably with any part of the province. The value of these watercourses, not only in connection with water-power but with fishing, municipal water supply and irrigation, cannot be overestimated.

The utilization of a number of the water-powers in connection with mining, pulp and paper industries has contributed very largely to the development of Central British Columbia. The revenue from the output of the mines and forests of the province has greatly exceeded that from all other industries, and without such power as has been developed, the advance in the development of these industries would not have been possible.

So far the greater part of the power development north of the 52nd parallel of north latitude has taken place along the coast. Plants for the manufacture of pulp and paper have been established at Ocean Falls and Swanson Bay. At Surf Inlet and Falls river the developments are used for mining and smelting. The corporation of Prince Rupert has developed power at Woodworth's lake, seven miles from the city. The power is used to provide electrical energy for the city of Prince Rupert and the terminals of the Grand Trunk Pacific railway. Inland about 150 miles from Prince Rupert, and $4\frac{1}{2}$ miles from Skeena Crossing, the Rocher Déboulé Company has installed a small hydro-electric plant in connection with the development of a high-grade copper proposition.

In addition there is still a certain amount of power used for placer mining, but the output from this branch of the mining industry has dwindled from nearly \$4,000,000 in 1863 to \$600,000 in 1915. At the present time the only operations of any magnitude are carried on in the vicinity of Barkerville. Water for sluicing operations has been used from Willow, Lightning, and Williams creeks and their tributaries.

The water courses of Central British Columbia might be classed under three divisions, namely, the Coast drainage basin, including the Skeena and Naas River basins, the Fraser drainage basin, and the Mackenzie drainage basin.

Of the Coast streams, the Skeena and Naas rivers possess the greatest potential power. The power on the Skeena river and its tributaries, of which Kitsumgallum, Zymoetz, Bulkley and Morice are the most important, has been estimated at 86,000 horse-power. The power on the Naas river and tributaries has been estimated at 115,000 horse-power.

There are altogether too many power sites in the Coast drainage basin to make mention of here. The report on "Water Powers of British Columbia"[†] mentions 114 power sites on the mainland Pacific coast between the 52nd and 57th parallels of north latitude.

*Data for the section on water-power were compiled by Mr. R. G. Swan, District Chief Engineer in charge of the Dominion Water Power Branch staff in British Columbia, after consultation with Mr. Cleveland, Comptroller of Water Rights of the British Columbia Lands Department, Victoria, B.C.

[†] Commission of Conservation, 1919.

It might be well to call attention here to the proximity of lakes Loring, McAuley, Emerald, Tahtsa, and Eutsuk to tidewater. The elevation of the above mentioned lakes is approximately 3,000 feet. The first two drain into the Bulkley river and the others into the Nechako river. They are, however, all within a fairly short distance of Gardner canal, and the possibility of utilizing this head by diverting the waters into Gardner canal will doubtless receive early consideration.

Proceeding eastward, the second division includes the Fraser river and tributaries, of which the Chilcotin, Quesnel, Blackwater and Nechako rivers are the most important. The power in the Fraser River basin has been estimated at 600,000 horse-power.

It is possible that owing to the proximity of the roadbed of the Grand Trunk Pacific railway to the Skeena and Fraser rivers, a certain amount of the power above referred to cannot be developed.

Of the third division, that included in the Great Mackenzie drainage basin, or more locally within the drainage basin of one of its principal sources or tributaries, the famous Peace river, the water-power possibilities are practically unknown. West of the Rocky mountains, the principal rivers are the Finlay and Parsnip, which unite to form the Peace, and the Omineca and Nation, which are tributary to the Finlay. East of the Rockies the principal tributaries of the Peace in Central British Columbia territory are the Pine and South Pine rivers.

Next in importance to mining and lumbering comes the fishing industry. It is one that must be seriously considered in all power development schemes in order that such an important industry shall not in any way be damaged.

The preservation of salmon is of vital necessity to the province, and to that end a number of hatcheries have been established on the inland waters for the propagation of the young salmon. No obstruction should be allowed to remain in any stream which might hinder the fish from reaching their spawning grounds, or the access of the young fish to the sea. In every power development which includes any form of dam the laws of the province require that provision be made to allow of the passage of fish.

The use of water for municipal water supply is unquestionably one of its most important utilizations, and no effort should be spared to prevent the pollution of waters by domestic sewage and industrial wastes. It is of interest to note that before the Provincial Government will grant a water license for this purpose the quality of the water must be approved by the Provincial Board of Health. Both the Dominion and Provincial Governments have placed reserves on many watersheds in the interests of communities, and in several instances not only the water, but all other resources on the watersheds have been reserved.

Throughout the province are many navigable lakes and rivers. In the development of the different railroad systems the flat-bottomed stern-wheeler has played an important part in the transportation of men and supplies along the lines of the railway. There are stretches on many of the large streams that are, however, not navigable. The erection of dams for power purposes would, at a number of places, improve the rivers for navigation by drowning out the rapids. For the most part, the railways of the province follow the larger river valleys and, since the completion of the roads, river steam-boating has been gradually dying out. Under the circumstances, the fact

that the interest of navigation has generally been considered prior to those of power, is not likely to conflict with any important future power development or other uses of the water resources.

Relatively little irrigation in British Columbia at the present time is carried on north of the 52nd parallel of north latitude. This is no doubt due to the fact that, owing to the difficulty in transporting farm produce, the greater part of the land has been used in connection with stock raising. No doubt when the line of the Pacific Great Eastern railway opens up this country, a great part of the land will be taken up, and while the average rainfall is greater than in the dry belt, still to insure successful farming it will be necessary in some localities to supplement the rainfall by irrigation.

Investigations of the water resources of British Columbia are being made by both federal and provincial engineers. The Dominion Water Power Branch of the Department of the Interior, Ottawa, acts in co-operation with the Provincial Water Rights Branch, Victoria, in carrying out an extensive hydrometric survey of the province. R. G. Swan is the chief engineer of these federal operations and E. A. Cleveland is comptroller of water rights for the province. A number of reports, covering the progress of this hydrometric survey from 1913 to 1918, have been issued by the Dominion Water Power Branch. They comprise Water Resources Papers Nos. 1, 8, 14, 18, 21, and 23. Under the direction of Mr. Cleveland the province is carrying on detailed surveys of the more important power sites and are also investigating the storage possibilities of many irrigation streams for the purpose of augmenting the water supply.

An excellent report on the water-powers of British Columbia, by G. R. G. Conway, Consulting Engineer of the British Columbia Electric Railway Company, is embodied in Water Resources Paper No. 16, entitled "Water Powers of Canada."

The Commission of Conservation have recently issued an exhaustive report entitled "Water Powers of British Columbia." The subject is treated very fully, the report containing over 600 pages, with numerous maps and illustrations. Numerous sites in Central British Columbia were investigated by the author of this report and the available power estimated.

The report "Central Electric Stations in Canada" is more recent and has been printed in two parts. Part I. Statistics, is issued by the Dominion Bureau of Statistics as a Census of Industry, 1917. It was prepared in collaboration with the Dominion Water Power Branch. Part II. Directory, by J. T. Johnston, Assistant Director of Water Power, has been published as Water Resources Paper No. 27.

The administration and control of the water resources of the province are in the hands of the Provincial Government, which issues regulations governing their disposal or development.



Outdoor roses in Skeena valley.



A glimpse of Prince Rupert's magnificent harbour.

TRANSPORTATION AND COMMUNICATIONS

By the completion of the Grand Trunk Pacific railway in 1914 Central British Columbia attained the initial advantage of a through transcontinental service and a solid foundation on which to build up an elaborate and adequate local system of inland transportation. The Pacific terminus, Prince Rupert, is several hundred miles nearer the Orient than Vancouver, Seattle or San Francisco, and the establishment of a transpacific steamship service from this point is expected in the near future. To form some estimate of what these advantages will mean one has only to observe the wonderful advancement attained by southern British Columbia following the building of the Canadian Pacific railway. This road was only completed in 1885, prior to which date the central belt of the province was better known than the southern. Immediately conditions were reversed, and the growth and development of territory adjacent to this railway has been most marked, with Vancouver, its Pacific terminus, becoming a great commercial and shipping centre.

The Grand Trunk Pacific railway proper is the western part of the great Canadian transcontinental line built by or with the assistance of the Government of Canada between the years 1904 and 1914. This section of the line extends from Prince Rupert, the Pacific terminus, to Winnipeg, while the eastern section extends from Winnipeg to Moncton. The original arrangement called for the construction of the eastern part by the Government, the construction of the western part by the Grand Trunk Pacific Railway Company and the operation of the entire line by the company, the Government to receive a certain rental for its part. The company, however, operated only the western lines, while the eastern lines were absorbed as part of the Government railway system. Arrangements were later completed for the taking over by the Government of the balance of this line, and before the end of the year 1920 the Grand Trunk Pacific railway became a part of the great government-owned and operated "Canadian National Railways."

Another great Canadian transcontinental railway passes through a small portion of Central British Columbia, namely, the road formerly known as the Canadian Northern railway, now owned by the Government of Canada and known under the name of "Canadian National Railway." It enters this district from the east by the same route as the Grand Trunk Pacific, namely, through the Yellowhead pass. However, it soon swings southerly by way of the North Thompson valley, and at Kamloops comes in contact with the Canadian Pacific railway. It parallels this road westerly from this point to Vancouver, which city is also its Pacific terminus.

The Grand Trunk Pacific is therefore the main thoroughfare for east and west traffic in Central British Columbia. From tide-water at Prince Rupert, which is an excellent location for an ocean terminus, having an unexcelled natural harbour, it ascends the valley of the Skeena river, serving the numerous canneries found along these waters and the lumber, pulp and mining industries springing into prominence on this part of the coast.

In passing through Hazelton it assures this mining centre of adequate and permanent shipping facilities for the great tonnage of ore and coal that will doubtless soon be forthcoming from the Groundhog areas.

It then traverses the famous Bulkley valley, with rich farms and ranches on the level lands and coal and minerals in the adjacent mountains. The coast summit is reached at Rose lake, with an altitude of only 2,363 feet.

The great fertile interior plateaus are then traversed, opening up vast agricultural areas along the Endako river, Fraser lake, Nechako river and upper Fraser valley.

The lowest point on the railway in this interior section is at Prince George, where the elevation is 1,867 feet above sea-level. Easterly from this city the railway ascends the Fraser river to its headwaters, passing through a wide fertile valley covered with immense quantities of valuable spruce and other woods.

The continental divide and the British Columbia-Alberta boundary is crossed at the Yellowhead pass, the elevation of which is only 3,716 feet. The total distance from Prince Rupert to this point, that is the length of the Grand Trunk Pacific in British Columbia, is 704 miles. Another 249 miles brings the line to Edmonton, while the total distance from Prince Rupert to Winnipeg, the entire main line of this railway, is 1,752 miles.

From Red Pass Junction, at mileage 677 east of Prince Rupert, to Lobstick Junction in Alberta, at mileage 884 east, the Grand Trunk Pacific and Canadian National railways now use a common track. The original tracks paralleled each other very closely through the Yellowhead pass. During the progress of the war the Government arranged for the joint use of one set of rails on this section, thus releasing the other for overseas construction. Now that both lines have come under permanent government control, this arrangement, with certain modifications, will in all probability be adhered to.

The construction of the Grand Trunk Pacific railway is of a most thorough and permanent nature. The location has been most carefully chosen and the road-bed solidly built. It is constructed on a four-tenths per cent grade and the sharpest curve is four degrees. No other railway crossing the Rockies has so low a grade, and the curvature is the easiest of any transcontinental line in America. Bridges and culverts are designed to the highest and most modern standards. Standard main line rails are used throughout.

Over one hundred stations have been provided for within Central British Columbia of which seven are divisional points. Coaling stations, water tanks, wyes and side tracks have been amply supplied. Both telegraph and telephone equipments are installed and trains are operated by telephone. At present traffic is comparatively light, but with the further development of the district and the establishment of trans-pacific steamship connections, it may be expected rapidly to assume greater proportions. The road has been built in anticipation of this and is of the highest standard throughout.

Some interesting facts are disclosed on comparing the British Columbia section of this railroad with that of the Canadian Pacific. The Grand Trunk Pacific crosses the Rockies and enters British Columbia at Yellowhead pass and the Canadian Pacific does so at Kicking Horse pass. The elevation reached at the Yellowhead is 3,716 feet, that at Kicking Horse pass is 5,332 feet, being 1,616 feet higher than the more northerly route.

The elevation reached by the Grand Trunk Pacific in crossing the intervening divide—the Coast range—is 2,363 feet, while the Canadian Pacific climbs to 3,787

feet in the new Rogers pass tunnel on the Selkirk divide. The old summit here was 4,340 feet. The tracks of the Grand Trunk Pacific at Prince Rupert are 19 feet above sea-level, while those of the Canadian Pacific at Vancouver are 14 feet.

The mileage of the Grand Trunk Pacific from the Yellowhead pass to Prince Rupert is 704. That of the Canadian Pacific from Kicking Horse pass to Vancouver is 519. The Canadian National railway has a length of 516 miles between Vancouver and Yellowhead pass. The Yellowhead route to Vancouver is thus 3 miles shorter within British Columbia than the Kicking Horse route, while the length of the Grand Trunk Pacific from this divide to the sea is nearly 200 miles longer than either of the others. Every mile of this distance, however, is rich in natural resources of one species or other and the railway serves a vast territory of 700 miles in length by some 300 in breadth.

There are two other railways to which Central British Columbia looks for the development of a more north and south line of transportation. These are the Pacific Great Eastern railway and the Edmonton, Dunvegan and British Columbia railway. The Prince George Eastern is now in the hands of the Provincial Government of British Columbia. It was commenced some few years ago from Squamish, a point at the head of tide-water in Howe sound, a few miles north of Vancouver, and built northeasterly to cross the Fraser river at Lillooet. The grading was carried northerly, and, meeting the Fraser again at Soda creek, followed up its valley as far as Prince George. The location was then carried north and east to cross the Rockies by the Pine pass and enter the plateaus of the Peace River district.

The Edmonton, Dunvegan and British Columbia railway belongs to the J. D. McArthur interests. Its operation was taken over in 1920 by the Canadian Pacific Railway Company. It commences at Edmonton and runs northerly and westerly to McLennan and Spirit River in the Peace River district. From McLennan, a branch, known as the Canada Central, runs northerly to Peace River. From Spirit River another branch, part of the main system, runs south to Grande Prairie. The extension of the main line westerly from Spirit River has been graded some 55 miles further to enter the province of British Columbia at Pouce Coupé.

It has been generally supposed that these railroads should connect somewhere about this point, the one traversing British Columbia and the other Alberta. Together they would give a line from Edmonton to Vancouver by way of the great agricultural areas of the famous Peace River and Central British Columbia districts. Both roads fell behind their building schedule. The Edmonton, Dunvegan and British Columbia appears to be indefinitely halted at Spirit River but construction on the Pacific Great Eastern is again under way. Steel reached Quesnel some time ago and is now as far as Cottonwood canyon. Between this point and Prince George contractors are now at work. It should be a matter of only a short time till steel has been laid to connect with the Grand Trunk Pacific.

The matter of the extension of this line north of Prince George and through the Rockies to the Peace River district is now receiving the attention of the provincial authorities. It has been advocated by many that a better route than the Pine pass would be found by following the Parsnip river to Finlay Forks and thence following the Peace river through the mountains by way of Hudson Hope. This would make accessible the great Omineca mining district and the mineral deposits of Mount Selwyn and coal deposits of the Carbon River district.

At any rate it is evident that the line must be pushed without delay into this part of the province, which, by nature of its geographical position, is now cut off from the main part. The road will not only weld this district to the mother province but will prove an avenue of commerce by which the agricultural products of the great Peace River district will find their way to the Pacific coast—their logical shipping point. An air line from Peace River town to Prince Rupert is about 525 miles in length as compared with 1,275 miles, the approximate length of a similar line to Fort William. The distance to Vancouver is about the same as that to Prince Rupert. It is thus evident that the logical direction for the movement of the Peace River products is west.

The bonds of the Edmonton, Dunvegan and British Columbia railway are guaranteed by the Provincial Government of Alberta. As the improvement and extension of the road is now becoming a matter of vital importance and economic necessity it may be safely assumed that some action will shortly be taken by provincial or federal authorities to insure this work being carried out.

Central British Columbia may therefore expect to have the additional advantage of north and south lines of transportation. With these main trunk lines radiating from the vicinity, with Prince George as centre, the interior development should be assured. Branch lines and feeders to tap various agricultural, mining or lumbering regions could then be built as required with a minimum of expense.

Along the coast are to be found a number of short railways built and operated by various companies in connection with their mining, lumber, or pulp industries. These lines are usually narrow gauge and in some cases electrified.

Of water transportation two principal divisions may be considered, namely, ocean and inland. These may each be subdivided, the ocean navigation into foreign and coast service, and the inland into steamboat and small craft operations.

Foreign or trans-pacific steamship service from Central British Columbia has not yet been established or developed to any great extent. It offers, however, a most attractive field for investment. Prince Rupert is built on Kaien island, and is surrounded and hemmed in by groups of islands and overhanging hills, forming a most extensive and safe natural harbour. It is the natural outlet for the products of the great fertile interior of Central British Columbia and Northern Alberta and the centre of the great fishing, lumbering and mining industries of the coast regions north of Vancouver island.

The geographical location of this port gives it a tremendous advantage in Oriental connections. It is 480 miles nearer Yokohama than is Vancouver. Its splendid harbour, rich adjacent territory and trans-continental railway connections, together with its mild climate, making it an all-the-year-round port, should result in the establishment shortly of regular steamship services to the principal Pacific ports of call.

The coast steamship service, unlike the foreign, is highly developed, and vessels in this service are continually coming and going, to and from Prince Rupert and other ports of call. The Pacific coast, from the strait of Juan de Fuca to the head of Lynn canal, provides one of the most beautiful and famous land-locked ocean routes in the world. It is protected from the main ocean by the insular system, comprising

groups of islands of varying size, stretching over almost the entire course and affording protection and an "inside passage" of approximately 1,000 miles in length. Snow-capped mountains, whose lower slopes are clothed in dense evergreen woods, rise from the shore lines on both islands and mainland. Here and there rocky fissures or gleaming glaciers break the expanse of green by slashing it from the snowline to the water's edge. Many deep and irregular inlets, fiords and countless islands of green woods and grey rocks give an intricate and ever-changing route of pleasing variety. Lighthouses, buoys and beacons mark out the course which, in places, narrows down between numerous islands to resemble a winding river. This is a favourite voyage for tourists.

There are several steamship lines operating on the coast run, which extends from Seattle, Victoria and Vancouver on the south to Anyox and Skagway on the north. Principal of these are the Canadian Pacific, Grand Trunk Pacific and Union Steamship companies. Chief ports of call in Central British Columbia are Ocean Falls, Swanson Bay, Prince Rupert, Port Simpson, Anyox and Stewart. Fleets of smaller steamers, gasoline boats, fishing smacks and sailing vessels give the coast a busy appearance. With the establishment of extensive dry docks and shipbuilding plant at Prince Rupert calls of large and small vessels for repairs are becoming numerous.

Before the building of the Grand Trunk Pacific, especially during the gold boom days, river steamboats plied the Skeena from Port Essington to Hazelton. Others operated on the upper Fraser, Nechako and Stuart rivers. Their services are now practically discontinued except on the Fraser between South Fort George and Soda Creek.

On the Peace river steamboats with headquarters at the town of Peace River operate up stream as far as the Rocky Mountain canyon. The principal ports of call inside the British Columbia line are Pouce Coupé landing, Fort St. John and Hudson Hope. The commodious and modern steamer *D. A. Thomas* is operated on this route by the Peace River Development Company, Limited. A smaller boat, the *Pine Pass*, and several gasoline boats also follow this run.

Above the canyon there is a triangular run, consisting of the upper part of Peace river and the lower parts of its affluents, the Finlay and Parsnip. No regular service is yet maintained on these waters, though a few small motor boats and numerous canoes are to be seen. The Finlay river could now be navigated by small steamers as far as Fort Graham and the mouth of the Ingenika, while the Parsnip offers a stretch to the mouth of the Misinchica, with possibly entrance to McLeod lake at high stages of the water.

Throughout the district there are to be found many networks of lakes and connecting rivers, which offer means of travel by water in every direction. The many lakes also offer excellent fields for boating both for pleasure and convenience. As settlement spreads around these bodies of water small service boats are soon placed on them; these serve a useful purpose, especially in the early days of development, when roads are few and poor.

As to roads and trails, Central British Columbia is singularly fortunate. In opening up now as a new country it finds itself in possession of many excellent highways provided by or for the use of the mining population of old days. Most worthy

of mention among these is the world famous "Cariboo road," built by the Royal Engineers with the assistance of the miners themselves under the direction of Governor Douglas during the early sixties. This excellent highway is the main artery of commerce for the interior. Commencing at Ashcroft, a town on the Canadian Pacific railway in the Thompson valley, now also served by the Canadian National railway, it runs northerly 220 miles to Quesnel and thence easterly an additional 60 miles to Barkerville, the centre of the Cariboo gold-fields. Climbing from an altitude of 1,000 feet at Ashcroft it reaches Clinton by way of the picturesque Bonaparte valley. The distance is about 34 miles and the grade very steep.

From Clinton the road, now closely paralleled by the P. G. E. railroad grade, climbs onto the high plateaus of the interior and runs by way of Lac la Hache and 150-Mile House to the east bank of the Fraser at Soda Creek. It closely follows this bank through Macalister, Alexandria and Kersley to Quesnel.

This road is still in a remarkable state of preservation and is subjected to heavy traffic. The completion of the Pacific Great Eastern railway will witness the passing of the long through stage service but it will always remain a main trunk road of this part of the Fraser valley. Auto stages make regular trips between Ashcroft and Quesnel, covering the 220 miles as a rule in one day. They also run between Quesnel and Barkerville. This section is good but has very heavy grades.

From this main trunk highway roads and trails branch off east and west to serve Horsefly, Quesnel lake, Chilcotin and Blackwater districts. A trail from the Barkerville district leads easterly to the valley of the south fork of the Fraser and meets the Grand Trunk Pacific railway at Rooney, while one from the Chilcotin crosses to the Bella Coola valley and follows it to the end of a road leading to the coast.

A wagon road with stage service operating on it runs from Vanderhoof to Fort St. James, and trails lead from that point to Manson Creek and Fort McLeod. Another good wagon road with stage service runs from Burns lake south to Francois and Ootsa lakes.

Along the old Ashcroft-Yukon telegraph line a road follows from Quesnel to Fort Fraser, with a branch leaving at the Blackwater crossing to run into Prince George. From Fort Fraser the road traverses the Endako and Bulkley valleys to Hazelton and for some 45 miles up the Skeena river above this point.

A road, now in rough condition, leads from Giscome, on the Fraser river, some 7 miles across the "Giscome portage" to Summit lake. A road leading north from Prince George joined this road about half a mile north of the Fraser river, but now a short-cut has been built, giving a direct line from Prince George to Summit lake and cutting out the old road. A great amount of traffic follows this route.

The Cariboo, Upper Fraser, Nechako and Bulkley districts have a fair asset of roads and trails for a new district and they are being added to and improved from year to year. The Terrace district has good local roads, also the lower parts of many coast valleys.

Better transportation facilities are required for the Naas district. A trunk road, giving an outlet from the Bulkley and Kispiox valleys and following down the Skeena valley to serve this territory locally and connect with Prince Rupert, would also be a great advantage. The road from Quesnel to Prince George requires improvement.

For so large a district with such scanty population the roads compare favourably with any district so situated, and the Highways Department of the province is keeping pace with the growth of the country in meeting the request for more and better roads. It is not a difficult country in which to build trails or roads and excellent transportation facilities will be a feature of the development.

The railways, steamboats and stages operating in this district all carry mail, which is further distributed by numerous regular carriers. Except in the most outlying settlements mail service is reasonably frequent and quite reliable. The number of post offices in Central British Columbia is being constantly added to. The gross postal revenue for the year ending March 31, 1918, amounted to \$22,817.42 at Prince Rupert and \$4,462.61 at Prince George.

The district is singularly fortunate in being provided with a number of telegraph lines. During the years 1878 to 1887 the Dominion Government constructed a line, for the benefit of the Cariboo mining district, from Ashcroft to Quesnel and thence to Barkerville. It is 276 miles in length and follows the Cariboo road. It is now adapted to both telegraph and telephone uses. At Ashcroft connection with the Canadian Pacific telegraph lines gives service to all outside points. A branch line, added in 1902, from 150-Mile House to Quesnel Forks, gives service to Harper's Camp and the Quesnel Lake district. It is 89 miles in length. These lines are used locally to a great extent.

When the rush to the Klondike gold-fields took place the need of telegraphic connection with new centres then springing up became urgent. Commencing in 1899, the Dominion Government constructed the famous Ashcroft-Dawson line, which now reaches to the Yukon-Alaska boundary line at Eagle—a total distance of 1,777 miles. It follows the Cariboo road as far north as Quesnel, then cuts across to Fort Fraser, and traverses the Endako and Bulkley valleys to Hazelton. Thence runs north, traversing the Kispiox valley and following the divide at the head of Naas river to cross the Stikine at Telegraph Creek, beyond which it reaches Atlin, Whitehorse and Dawson.

From Hazelton a line was built down the Skeena valley during the years 1901-07 to Prince Rupert, Essington and Port Simpson. It is 218 miles in length, with some twenty-two offices. A number of local telephone lines also radiate from the Hazelton office.

From Terrace, on the Hazelton-Prince Rupert section, another branch of 174 miles was constructed in 1910-11 to Anyox and Stewart. It follows up the Kitsumgallum valley, crosses the Naas river at Upper Naas, and swings around the head of Alice Arm. There are eight offices on this section.

In 1912 a branch line was built from 150-Mile House on the Ashcroft-Quesnel line westerly through the Chilcotin district, across the Coast range of mountains and down Bella Coola valley to the coast. The length of this branch is 329 miles, with twenty-eight offices. It touches Chimney Creek, Riske Creek, Hanceville, Alexis Creek, Redstone, Chilanko Forks, Tatla Lake, and other points. Telephones only are now used on this section.

Still another Dominion Government line serves the Peace River district east of the Rockies. It is some 700 miles in length, running from Edmonton to Peace River



Oat field on ranch at Francois lake, British Columbia.



Historic Town of Hazelton, centre of the Omineca mining activity.

and serving in British Columbia such points as Swan Lake, Pouce Coupé, Fort St. John, Halfway River and Hudson Hope.

On the coast there are several wireless stations, giving direct connection with each other, ships at sea, and the principal wireless stations of the more thickly settled southerly parts. Many large industrial plants have wireless systems of their own.

There is no reason to doubt that the extension of these facilities will keep pace with the development of the country. Prince Rupert and Prince George now have telephone systems of their own. A telephone line from Prince George to Blackwater gives connection with the Ashcroft-Dawson line. Additional to these lines are the wires of railways, which give a commercial service from all stations. The extension of the mail service to include rural free delivery in agricultural settlements and the establishment of rural telephone lines is only a matter of time.

EDUCATION AND SOCIAL LIFE

Educational facilities throughout Central British Columbia are essentially the same as exist over the entire province, excepting that possibly the handicap caused by the isolation of families in remote corners is felt to a greater degree. Education in Canada is administered by the Provincial Governments independently of each other. The departments of these various Governments dealing with this important matter strive to keep abreast of or outdo each other, with the result that most progressive and thorough educational policies are being carried out.

The education of all children in public schools erected and maintained by the Education Department is both free and compulsory. In the larger centres high schools are maintained in like manner. Attendance on the part of the children at these institutions is also free.

The great areas with scanty population in Central British Columbia make the duty of providing for the education of the children a most serious matter. In its endeavour to place within the reach of every child the opportunity of acquiring an elementary education the Government has gone so far as to provide for the erection of a school house and the supplying of a teacher where a minimum number of ten children are found in any locality. An average attendance of eight was required to keep such schools open. As may be readily imagined in such outlying localities, some of these children would have long distances to go to and from school. Roads in such localities are not of the best, and when inclement weather occurred it was difficult for such children to maintain a regular attendance. The average, therefore, has been reduced from eight to six, in order to permit the continuance of some schools which would otherwise be forced to close down. It has often been suggested that the minimum might be made still lower.

Another suggestion that is being considered by the Department of Education is the establishment of central resident schools throughout the rural districts. With the improvement of roads it might often be found advantageous to establish consolidated schools, embracing several small districts and providing for the transportation of children by stage or motor-car.

The department is most anxious that every boy and girl growing up in any part of the province should be provided with a free preliminary education. The difficulties of carrying this out in remote and sparsely settled sections are only too obvious. Not only would the expense entailed be out of all proportion to the results obtained, but it would be impossible to secure the services of teachers willing to isolate themselves in such parts. Hunters, trappers, prospectors and other men who follow similar occupations rarely, if ever, take their families, if they have any, into the isolated districts. Hence their self-banishment concerns themselves only. The settler, however, who takes with him a young family into a new district of Central British Columbia carries with him the responsibility of his children's education. It should, therefore, be his aim to guard against locating in any isolated part where he is likely to be cut off for many years from the advantages of the school.

By keeping closer to the older settled parts, or by entering those districts which are being opened up and settled in a pronounced manner, he is sure of finding the educational advantages keeping pace with other development. Should the locality in which he desires to locate be a remote one it would be to his ultimate advantage, and the immediate advantage of his children, if other families having children of school age could accompany him, in order that the minimum number of ten children might be found in the locality. With the rapid settlement of large areas of Central British Columbia's fertile lands and the springing up of numerous towns, the disadvantage due to lack of means of education will rapidly disappear. The gathering together of large numbers of families in the lumbering, mining and fishing centres also makes the providing of schools for their children an easy matter.

There are two municipal school districts in Central British Columbia, namely, the cities of Prince Rupert and Prince George. At Prince Rupert there are graded schools of seventeen divisions, and at Prince George of six divisions. At Prince Rupert there is a high school of three divisions. Prince George has also high school advantages. In addition to these city schools, there are public schools at nearly one hundred centres scattered throughout Central British Columbia.

On the coast schools elsewhere than at Prince Rupert are to be found at Alice Arm, Granby Bay, Granby Bay Mine, Stewart, Bella Coola, Bella Coola Lower, Cedarvale, Copper City, Essington, Phelan, Kitsumgallum, Metlakatla, MacKenzie, Noosatsum, Ocean Falls, Osland, Pacific, Port Clements, Sandspit, Simpson, Sunnyside Cannery, Surf Inlet, Surf Inlet Mine, Swanson Bay, and Usk.

In the interior districts adjacent to the Grand Trunk Pacific railway, and the Peace River District, the following settlements, in addition to Prince George, have schools: Beaverley, Blue River, Bracside, Chief Lake, Chilco, Collishaw, Dawson Creek, Dome Creek, Dunster, Ellesby, Engen, Fort Fraser, Fort George, Fort George South, Giescome, Hartley, Hutton, Lake District, Landry, Lee, Loos, Lucerne, Maps, Mud River, McBride, Nechako, Pouce Coupé, Pouce Coupé Central, Pouce Coupé North, Rose Valley, Saskatoon Creek, Stuart River, Swift Creek, Vanderhoof, Willow River, Bulkley North, Bulkley South, Burns Lake, Endako, François Lake, François Lake South, Hazelton, New Hazelton, Houston, Alexander Manson, Nithi River, Ootsa Lake, Round Lake, Smithers and Telkwa.

The Cariboo district has schools at Alexandria, Barkerville, Beaver Lake, Castle Rock, Chilcotin, Chimney Creek, Dragon Lake, Glencoe, Harper's Camp, Hilborn,

Meldrum Creek, Macalister, Quesnel, Rose Lake, Sister's Creek, Soda Creek, and Williams Lake.

The teaching staff of Central British Columbia numbers about 140. Of these about twenty-four hold academic qualifications. There are about the same number holding first-class teachers' certificates, forty-five holding second-class certificates, twenty holding third-class, with twenty-five or thirty temporary and special teachers. Male teachers constitute about one-third of the total.

Throughout the province the average salary paid teachers in the year 1916-17 was \$1,002.96. Male teachers received average salaries according to certificate as follows: Academic, \$1,587.60; first-class, \$1,451.28; second-class, \$1,175.76; third-class, \$957. Female teachers received average salaries according to qualifications of: Academic, \$1,075.92; first-class, \$936.60; second-class, \$856.56; third-class, \$827.52.

The buildings erected for school purposes are substantial and modern, and as nearly as possible designed to meet the requirements of each individual section. They are well heated and lighted and provided as far as possible in all cases with the most complete sanitary arrangements. The furniture and equipment is of the best and the children are supplied with free text books. The qualifications of the teachers are of a uniformly high standard.

The local control of the school and the engagement of teachers rests in the hands of a board of trustees appointed by the ratepayers of the district. The administration of the educational affairs of the province at large, however, rests with the Department of Education, presided over by a Minister of the Cabinet. The standard of qualifications for teachers, the receiving and voting of money for educational purposes, the opening and maintaining of schools, the authorization of text books, the laying out of school curriculum, and the fixing of examinations are controlled by the department, assisted by a staff of inspectors. Schools are visited by these inspectors at least once or twice a year, sometimes oftener. The schools attended by the children of Central British Columbia and the progress accomplished along educational lines are said to compare favourably with those of any of the older settled parts or largest cities of the Dominion.

The social advantages of Central British Columbia are on a par with those of any parts of the country classed as "new," or "frontier." True, the settlement is sparse and scattered and includes people of many nationalities. Yet it is singularly peaceful and law-abiding. The prompt and determined action of Governor Douglas, in despatching troops to prevent threatened lawlessness and violence during the early mining days in the Cariboo, left a salutary effect that is not forgotten. The arm of the law is long and British justice fair, but unflinching. There is no room in this district for "outlaws," even though it is wild and lonely by nature. Deeds of violence are not tolerated. Criminals of this class have found to their astonishment that the world is small and the apparent impregnable hiding grounds of these regions are an open book to the handful of unflinching police who patrol their depths. The inability of desperadoes to perpetrate a crime and "get away" with it in the interior of Canada's lone lands is now well known and few are foolish enough to attempt it. The unlocked doors and unguarded herds are seen on every hand. This feature is most marked and pleasing.

The wholesome respect manifest throughout the length and breadth of this vast land for the laws of the country is most encouraging. The new-comer has the assurance that his life and property are as safe from acts of violence perpetrated through lawlessness as if he were in any more densely settled section. This applies not only to the rural or isolated parts, but to the mining centres, lumbering camps and towns.

There is another praiseworthy feature in connection with the laws of these lands that might be mentioned, and that is the straightforward attitude of the Federal and Provincial Governments in their dealings with new-comers. Regulations by which persons may acquire lands and timber, fishing and mining rights, hunting and trapping privileges or generally become possessed of or permitted to enjoy the resources, the property of the state, are formulated and made public. Printed copies of these regulations are always to be had upon application to Government agents. Persons acquiring rights under the terms of any such regulations will find that upon fulfilment of the terms stipulated therein the government will complete their contract with despatch and furnish the coveted documents of possession. No quibble or technicality that might defeat the accomplishment of their efforts are permitted to be entertained. As long as a bona fide applicant has fulfilled the terms laid down he gets his reward without question.

The transportation facilities of all but the more remote parts permit of travel to and fro under modern conditions. Mail, express and freight are also carried with despatch. Telegraph lines are found cross-cutting the interior and giving service at nearly every small center. A number of wireless stations are located along the coast.

Newspapers are published in several of the larger towns. Libraries and reading rooms are found in the cities and in several towns, while the Provincial Government has a system of libraries by which the rural districts are furnished free with good literature.

Churches and hospitals are found in nearly all urban centres, the smaller towns all have some accommodation for the holding of religious meetings, and nearly all have cottage hospitals. Clubs, societies, and patriotic and athletic associations are widely found. Agricultural societies hold annual fairs in several localities.

The ever-increasing tourist and holiday traffic keeps up a continued activity. The opening up and development of various agricultural districts, lumbering areas and new mines, and the springing up of new towns, creates and fosters a keen and lively interest in the social welfare of the entire central belt.

THE FORT GEORGE DISTRICT

The Fort George Land Recording Division embraces a vast area lying on the western slope of the main Rocky Mountain range. Its eastern boundary is the summit of this range, on which are found such distinctive landmarks as Yellowhead pass, Pine pass and Mt. Selwyn. Westerly it includes the valley of the Fraser to its confluence with the Neeneko at Prince George and the lower part of the Nechako valley to a point about midway between Prince George and Fraser lake. It extends northerly and westerly to include the territory drained by the Parsnip, Finlay and Omineca rivers. To the south lies the famous Cariboo district. The upper part of

Canoe river basin is included in the Fort George division but the main Columbia valley, into which it drains, is excluded. The Thompson-Fraser divide also forms part of the southern boundary. The main Fraser valley below the confluence of the Nechako is included as far as Fort George canyon.

From west to east the principal sections of the southerly part of this division are: the lower Nechako and Chilako valleys, the Prince George-Hansard lake district, the Salmon river country, the South Fort George district, the South Fork of the Fraser river and the Canoe river valley.

The city of Prince George, the Grand Trunk Pacific divisional point, located on the flats immediately south and west of the confluence of the Fraser and Nechako rivers, is the principal business and administrative centre of Central British Columbia. About a mile and a half to the south, on the right limit of the main Fraser river, is located the town of South Fort George, and it is here that the Government Land Recording Office for the Fort George division is located. On a high, level, gravelly bench on the right limit of the Nechako river and just west of Prince George is the townsite of Fort George. There has been much rivalry and some litigation as to which of these locations should become the main centre, but the business houses have settled down to make Prince George the choice, with a possibility of residence sections spreading out to the other locations as the city grows. The location of the Pacific Great Eastern railway also passes through this city, and it promises to become an important shipping and distributing point.

Prince George was incorporated as a city in 1915. Its electric light and water systems are municipally owned. Several miles of streets have been graded and sidewalks built. The educational facilities are excellent, consisting of public and high schools of high standard. There are also three churches with resident ministers. Two of the leading chartered banks of Canada have established branches and all mercantile lines are well represented. The hotel accommodation is particularly good for a new country.

Prince George has a very central and strategic location with respect to the new areas of this part of Canada now about to be exploited. The Grand Trunk Pacific railway gives it a western outlet to Prince Rupert and an eastern one to Edmonton. It is hoped that the Pacific Great Eastern and Edmonton, Dunvegan and British Columbia railways will eventually be completed and give it direct connection to the south with Vancouver and to the north with the town of Peace River. Prince George occupies a hub position with these four important centres radiating to the cardinal points of the compass at almost equal distances of from 400 to 500 miles each. Its waterways also afford alternative routes over correspondingly large areas. One of the most used of these waterways is that travelled by the trappers and prospectors of Finlay. It leads from the city north over Giscome portage to Summit lake and thence by way of Fort McLeod and the Parsnip river to Finlay and Peace rivers.

The lower part of the Nechako and Chilako valleys forms part of the great interior plateau of rich agricultural lands lying along the Grand Trunk Pacific railway. They extend in a wide belt from Fraser lake to Prince George, the greater area lying north of the Nechako river. Most of this district has been surveyed and a fair part of it already taken up. There are many pre-emptions open, also considerable land for sale. The country generally is level to rolling, well watered with numerous small lakes and creeks, well drained, open or lightly wooded and with a large percentage of its soil very rich.

Wagon roads on the south side of the river run from Prince George to Vanderhoof and from Prince George for a few miles up the Chilako valley. On the north side of the river there is a road from Prince George to Chief lake, crossing the Nechako on a substantial bridge opposite old Fort George. Chief, Nukko and Swamp lakes lie about 15 miles to the northwest of Prince George and in this vicinity there is a good settlement with a school and a post office. The stations on the railway from Prince George west are Otway, Miworth, Chilako, Bednesti, Nichol, Isle Pierre, Hutchison, Wedgewood and Stuart, the latter just west of the mouth of Stuart river. McMillan creek enters the Nechako on its north limit opposite the west end of Prince George. The route of the Pacific Great Eastern railway follows up its valley, also the Prince George-Summit lake wagon road. There are no meadow lands in this section. The lower valley is heavily wooded but the upper part has been burned off and much is now under cultivation.

Northeast of Prince George, and north and east of Shelley station as far as Willow River, there is considerable bench land from 300 to 500 feet above the Fraser river and on its left limit. The Grand Trunk Pacific railway follows the river in this section, and there is also a wagon road which runs east from Prince George to 6-Mile lake, thence northeasterly to Tsadestsa creek and north to Willow River. In these sections there is considerable good land open for settlement. East of Prince George, however, the woods become heavier and the cost of clearing land increases. Willow River has a school, post office and stores. A few miles south is an outcrop of rock where several mining claims have been staked.

East of Willow River the railway follows a lake depression for some 25 miles up the centre of the valley till it meets the river again at Hansard where it crosses to its north shore. In this depression are Eaglet, Aleza, Hansard and other small lakes. The valley here is wide, the Fraser river following the northerly bank till it sweeps southerly in a big curve to Willow River. A short distance below Hansard the McGregor or North Fork of the Fraser joins, while from a point in the bend a few miles north of Willow River a wagon road some 7 or 8 miles in length leads over Giscome portage to Summit lake. Bear river enters the Fraser from the south nearly opposite McGregor. The Fraser river for some distance east and west of Hansard lake is an alluvial flood plain, with deposits of alluvium hundreds of feet in depth extending over a width of several miles.

There is considerable surveyed land available for settlement between Prince George and Hansard lake. The surface consists mainly of willow swamps, open meadows and lightly timbered swamps with belts of willows, poplars and cottonwoods bordering on the river. The soil is uniformly good. Some areas are wet and will require drainage, while others have heavier woods requiring expensive clearing. There are several sawmills in this section, located at Prince George, Willow River, Giscome, on the west end of Eaglet lake, Newlands, Aleza lake and Hansard lake.

South of Prince George the land on both sides of the river has been surveyed as far as Fort George canyon, the southerly limit of the Fort George division. The Pacific Great Eastern railway grade follows the east bank of the river. On the west side a wagon road leads south to Blackwater, on Blackwater river, by way of Nadsilnich lake, which lies between the Fraser and Chilako rivers. As a rule this is a rolling country, having low-lying hills usually running in a north and south direction, with level benches on depressions between. The soil on these is uniformly good while

on the ridges it varies from good to sandy and gravelly. Much of this district has been heavily wooded, though fires have burnt over large areas. Light woods cover almost the entire area. Clearing will cost \$15 to \$75 per acre in these light woods and up to \$150 per acre in the heavily wooded areas. Conditions indicate that when cleared it will make a good mixed farming section.

The Salmon river rises in the district northeast of Fort St. James and runs in a southeasterly direction to join the Fraser at a point nearly opposite Willow River. It drains a large, rolling tract of fairly good bench lands, averaging from 100 to 150 feet above its valley proper. Much of this area has been burned over and is now quite open. The soil is a rich, brown clay loam in the lower valley, sandy nearer the head of the river, gravelly on many of the ridges and in some sections rather badly burned by forest fires. One of its principal tributaries is Wright creek. The route of the Pacific Great Eastern follows the Salmon for some distance above the mouth of the Wright and the Prince George-Summit lake road crosses it immediately below. The valley bottoms are fairly heavily wooded and the benches, where not burnt over, more lightly.

The South Fork of the Fraser river rises in the Yellowhead pass in the Rocky mountains and flows in a general northwesterly direction to the junction of the North Fork or McGregor river a few miles below Hansard. The river's course is very winding, making its length nearly double that of the valley itself, which is fairly straight, narrow and bordered by high hills and mountains. The Grand Trunk Pacific railway follows the centre of the valley throughout, while the Canadian National railway traverses it from the Yellowhead pass as far down as Tête Jaune, and then swings southerly in the McLennan river valley. The Grand Trunk Pacific railway mileage from the Pass to Hansard is 191 miles and to Prince George 237 miles. Its elevation at Yellowhead pass is 3,716 feet above sea-level, at Tête Jaune 2,402 feet, at Hansard 2,005 feet and at Prince George 1,867 feet. In the 191 miles above Hansard the river's fall is thus 1,711 feet. The Grand canyon of the South Fork is found about two stations above Hansard.

This part of Central British Columbia gradually merges from the great interior plateau into the Rocky mountain district. It is a very rich lumbering district, the valley, benches and lower hillsides being heavily wooded, chiefly with spruce. While not so large as the coast species, these trees make excellent lumber, which finds a ready market in the Prairie Provinces to the east. Minerals and water-power resources are also extensive.

When cleared the flats and bench lands as far up as Tête Jaune will make excellent farms, the soil being very rich and the climate favourable. Vegetation in this valley is very luxuriant. The heavy snowfall and lack of range will not permit of extensive grazing but intensive farming should prove successful.

The principal points in this valley are McBride and Tête Jaune. Between Hansard lake and McBride there is much good timber, and also farming land that will be very valuable when cleared. McBride is a railroad town and a divisional point on the Grand Trunk Pacific. It has a school, church, post office and substantial array of business houses, hotels and residences. The valley here is about four or five miles wide and lightly wooded. The soil is good, though some of it is swampy and will

require draining. A considerable settlement has taken place here and farming operations are proving very successful. Excellent results are obtained in the growing of small fruits and garden supplies.

Tête Jaune is located at the junction of the McLennan river with the South fork of the Fraser. The merging of these valleys here gives a wide plain, open or lightly wooded and somewhat sandy and stony. This point was the upstream limit for light draught steamers which plied on the Fraser before the completion of the Grand Trunk Pacific railway. It is less than 50 miles west of the summit of the Rockies and may be considered the gateway of these regions. The Canadian National railway here swings to the southwest, follows up the right limit of McLennan river to Cranberry lake on a low summit, thence crosses the head of Canoe river and follows the Thompson river. Mount Robson park, an area of approximately 409,600 acres, set aside by the British Columbia Government, extends from a few miles above Tête Jaune to the summit of the Rockies and the Alberta boundary. In this area are found lake and mountains of unparalleled beauty and magnitude, including the highest of all Canadian peaks, Mount Robson, with an elevation of 13,063 feet.

The upper part of Canoe river valley is included in the Fort George division. This river is a tributary of the Columbia and joins it at Boat Encampment, the point where the Columbia reaches its farthest north and makes its remarkable right-about turn. There are some good bottom lands open for pre-emption in this valley. A few settlers are located here and have successfully grown crops for several years. About Cranberry lake there are some good bench lands which can be fairly easily cleared. The elevation here is 2,590 feet and summer frosts sometimes occur.

In the Canoe valley are found the Canoe river hot springs, situated alongside a small lake lying at the foot of the mountains and surrounded by large cedar trees. The merits of these springs have not yet been determined, but it is believed they could be exploited to considerable advantage.

North of the Fraser-Paremp divide and west of the Rocky mountains there has as yet been no serious attempt made to farm or ranch on account of the lack of transportation facilities. However, anticipating such advantages, trappers, miners and others have proved up on a considerable area at Finlay. Here the Finlay and Parsnip rivers, the one flowing southeasterly, the other northwesterly, meet almost head on, and, uniting to form the Peace, turn easterly and follow the gorge through the Rockies. At the point of their confluence there occur flats and bench lands of excellent soil, though fairly heavily wooded. Small crops have been raised here for many years, and vegetables, hay and grain have been found to grow very successfully.

While it is generally supposed that the upper waters of the Peace are derived from purely mountain streams, it must be borne in mind that the principal affluents, the Finlay and the Parsnip, are themselves large rivers, draining a vast territory in the nature of a trench or basin about 300 miles in length and averaging nearly 75 miles in width. Included in this area are many thousand acres of exceedingly fertile lands, found on various flats and benches along these rivers and their numerous tributaries, in big bends of rivers and creeks, and around the shores of countless lakes. The soil, as a rule, is river silt, vegetable mould, or sandy clay loam. Many of these tracts are heavily wooded, but others are more open and natural meadows are sometimes found. From their location, these tracts prove valuable lands, being usually sheltered by



Power house and workmen's cottages, Granby Consolidated Mining and Smelting Company, Anyox, British Columbia.



The historic town of Barkerville as it now appears.

overhanging banks or adjacent mountains, well watered and with an abundance of wood at hand. When local markets are created, by the development of mineral and other adjacent assets, these lands will prove most valuable locations for the production of garden, poultry and dairy supplies, hay, grain and meat, and for limited sheep and cattle ranching.

The principal tributaries of the Finlay river are the Manson, Omineca and Ingenika rivers, all entering from the west. The territory comprises the famous Omineca mining district, in which a limited amount of placer mining for gold is still being carried on. The principal trading post is Fort Grahame, on the Finlay, a few miles below the mouth of the Ingenika. Gasolene boats reach this post without difficulty from Finlay (Forks). Other posts are Germansen and New Hogem, on the Omineca. In the early mining days a pack route was made from Hazelton to these points, and goods are still brought in over this trail to a limited extent.

Tributaries of the Parsnip include the Nation river, which might be included as part of the Omineca mining district, and the Pack river, draining McLeod lake. Both of these enter from the west. From the east are the Mischinsinia and the Misinchinea, both heading in Pine pass. From Summit lake the Crooked river leads into McLeod lake. The usual canoe route from Prince George to Finlay and Hudson Hope is by way of Summit lake, Crooked river, McLeod lake and Pack and Parsnip rivers. Steamboat navigation would be feasible on the Parsnip as far up as the mouth of the Pack, and a light draught boat might even reach McLeod lake at high stages of water. The principal centre of this district is the old Hudson's Bay post at Fort McLeod, on McLeod lake.

About this post excellent gardens are to be found, but trapping is the principal occupation of the Parsnip valley. Fur-bearing animals are plentiful, and the high price of furs has resulted in an influx of trappers that are already overlapping each other's lines. Trapping, prospecting and mining are the only real activities of the upper Peace River district as yet, with a number of pre-emptors proving up lands in hopes of being able to farm or sell to advantage when the district is opened up.

Various estimates put the amount of suitable agricultural land in the Finlay-Parsnip valley as high as a million acres, and the soil, climate and other conditions necessary to successful farming are believed to be such that mixed farming and dairying particularly will prove highly remunerative when settlement becomes more general.

THE PEACE RIVER DISTRICT

The Peace River Land Recording Division of British Columbia includes that part of the Peace River drainage basin lying east of the main Rocky Mountain range and within this province. Its southern and western boundary is the summit of the range. The northern boundary is the height-of-land between the Liard and Peace rivers while its eastern limit is the Alberta-British Columbia boundary line, here being the 120th degree of west longitude. In this area is included the Dominion Government Peace River block of three and one-half million acres. It is nearly 75 miles square, and adjoins the provincial boundary, with the Peace river cutting it into two almost equal parts. Fort St. John is located near the centre of the block and Hudson Hope just within its westerly limit.

Within this block are found most of the level and open lands of Central British Columbia. Since they are controlled by the Dominion Government their disposal is in accordance with the Federal regulations. That part of the block lying south of the river falls within the Grande Prairie Land district, the local agency of which is located at the town of Grande Prairie, Alberta, with a sub-office at Pouce Coupé, B.C. The lands north of the river are included in the Peace River Land district. The local agency for this district is at the town of Peace River, Alberta, but there is a sub-office at Fort St. John, B.C.

North of the river there is considerable good surveyed land open for settlement under the Federal homestead regulations and on both sides of the river there are large areas of unsurveyed land suitable for grazing purposes.

The Fort St. John district, north of the river, is admirably suited to mixed farming and small ranching, though the distance from markets makes the latter the more suitable pursuit at present. The post itself is located on the river flats, and there is a limited amount of excellent land on various flats in bends of the river. The extensive areas, however, lie on a vast plateau about 800 feet above the level of the river and with an average elevation above sea level of about 2,400 feet. The land is nearly level, except where cut by deep ravines leading to the valley of the Peace, and is of a park-like nature, being open or slightly wooded.

The soil is a deep black loam and vegetation is very luxuriant. Peavine and wild grasses grow in great profusion. Vegetables and grains do exceedingly well and are seldom, if ever, injured by summer frosts. Tomatoes have been ripened on the vines and nothing but the lack of better transportation facilities seems to stand in the way of this section becoming as prosperous a farming region as any other part of the prairies.

The snowfall is light and the effects of the Chinook winds are frequently felt, so that cattle can often graze out during parts of the winter. It is advisable, however, that a stock-owner here should put up about three tons of hay per head of stock for winter feeding in case severe weather should be encountered.

Excellent grazing lands are found around Charlie lake, with an abundance of natural meadows and plenty of water. Good areas are also to be found along the North Pine river though the country is more broken by deep ravines, many of which are fairly heavily wooded.

During the summer months a regular steamboat service is maintained on the river, connecting at the town of Peace River with rail for Edmonton. A wagon road from Dunvegan to Hudson Hope leads through this district and it is also connected by trail with Pouce Coupé. The Dominion Government telegraph line from Edmonton to Hudson Hope passes through the post and affords a constant service to the outside world. General stores are operated at Fort St. John by the Hudson's Bay Company and Revillon Freres, and at a few points along the river front by individual parties. Settlers are beginning to locate in increasing numbers and cattlemen are bringing in stock very rapidly. The district promises to advance with a rush.

The Pouce Coupé district on the south side of the river, comprises several townships of gently rolling prairie and a number with scattered bluffs and light woods. The best area is included in a block of about 25 by 40 miles. This is practically all taken up. There are still a few good locations for farming and much excellent grazing land along the Pine and other rivers nearer the foothills.

Like the Fort St. John district, it lies on an elevated plateau and the soil and climatic conditions are equally favourable. The principal centres of settlement are Pouce Coupé and Rolla. About these villages are to be seen some excellent farms, and no better crops of wheat, oats, barley or rye could be found in any part of Western Canada during the season of 1921 than in this section. For mixed farming it cannot be surpassed.

The Edmonton, Dunvegan and British Columbia railway, which now operates trains as far as Peace River, Spirit River and Grande Prairie, is graded from Spirit River into Pouce Coupé village. It is hoped that the laying of steel on this 55-mile section will eventually be undertaken and also that the railway will be extended westerly. At present there are roads leading into the district from Spirit River, from Grande Prairie by way of Beaverlodge, and from a steamboat landing on Peace river about 30 miles due north of Pouce Coupé village. This village is also a station on the Government telegraph line.

Pouce Coupé and Rolla have business houses, banks and schools. With the extension of steel to give adequate transportation facilities, this district will have a very promising future. Boring for oil is being vigorously prosecuted in this vicinity.

Hudson Hope is the gateway from the great plains to the mountain regions, being at the foot of Rocky Mountain canyon. From this point the river is navigated without interruption as far north as Vermilion chutes, a distance of some 525 miles.

On the flats adjoining the river are to be found some excellent lands, now nearly all taken up. On the higher plateaus, on either side, there is much good land suitable for grazing, and a considerable area that would make excellent farming land with a little clearing. Grain and vegetables have been grown with success for years. To the north and east there is good grazing land along the Halfway river. Large herds of cattle have recently been taken in there. Eighteen miles south of Hudson Hope is Moberly lake, about which lies some excellent land, very rich and open or lightly wooded. Some of the choicest locations here are under reservation for Indians. Along Moberly river good grazing lands are found in patches, but some of the land is thickly wooded.

The canyon is passed by a 14-mile wagon road leading from Hudson Hope to the upper end of the rapids. Along this road there is some good land, with one fine stream and several meadows, but some sand ridges also occur. The country is gently rolling and only lightly wooded.

Hudson Hope has a regular steamboat service during the summer months and is the terminus of the Government Peace River telegraph line. It is connected by wagon road with Fort St. John. By river it is some 229 miles above the town of Peace River. Above the canyon there is good navigation to the head of the Peace at Finlay. A transport service, as required, is maintained on the portage by settlers located at Hudson Hope.

The Peace River route would afford a railway an excellent pass through the Rocky mountains, though the Pine pass, a few miles further south, has received more publicity. With the development of this part of the country it is not unlikely that both routes might be utilized. The canyon affords a site for extensive water-power development, and in this vicinity large areas of high grade coal are known to exist. Hudson Hope then occupies a very strategic position, and some day may become

an important centre, when the varied resources of the surrounding district are more fully developed and through transportation is established.

The agricultural lands east of the Rockies and not included in the Peace River block are not extensive. Below Mount Selwyn the valley of the Peace is very narrow, the mountains rising practically from the water's edge on both sides, as far down as the mouth of Ottertail creek. Here is found a small V-shaped flat, where the gorge-like valley of the creek merges into the river's valley, and for the remainder of the distance to the head of the canyon such flats are found, in varying extent, at the mouths of all tributary streams.

Below Carbon creek the valley of the Peace becomes wider and several large fertile flats occur at bends of the river. A number of lots, chiefly coal claims, have been surveyed on both sides of the canyon, while scattered pre-emptions have been taken up along those portions lying outside the block of the Halfway, Lynx, Moberly and Pine rivers. South of Pouce Coupé a number of townships have been surveyed adjoining the south boundary of the block and the Alberta-British Columbia boundary. Here a considerable settlement has taken place, particularly around Swan lake. This is an excellent cattle district, and much good agricultural land could be easily cleared. The trail and telegraph line from Grande Prairie to Pouce Coupé pass through this section.

At present, owing to natural barriers, this part of British Columbia is to a certain extent cut off from the remainder of the province and is more closely connected in its development with the Peace River districts of the adjoining province of Alberta. This condition will be overcome to a great extent when a railway is constructed to give direct connection to Central British Columbia and the Pacific coast. To keep closely in touch with this part of its domain the Provincial Government recently established a Land Recording office for the Peace River district at Pouce Coupé.

THE CARIBOO DISTRICT

The Cariboo Land Recording Division embraces those historical gold-fields which were the scenes of wild excitement in the middle of the nineteenth century. The stampede of miners to these fields heralded the first extensive invasion by the white man of the mainland of British Columbia. Started by discoveries of gold on the Lower Fraser and Thompson rivers in 1856 by a few isolated prospectors and trappers, the tide of frenzied gold-seekers swept northerly and up the Fraser river till they reached their goal in the Cariboo mountains. Here the magic towns of Richfield and Barkerville sprang up, and for many years the Cariboo district constituted the metropolis of the whole mainland colony. The 52nd parallel of north latitude is the southern boundary of this land division, and the 124th degree of west longitude its western boundary. Easterly it extends to the North Thompson divide and northerly, generally speaking, to the summit overlooking the valley of the South Fork of the Fraser river and to Fort George canyon on the main Fraser.

Midway through this district, from north to south, flows the Fraser river. The grade of the Pacific Great Eastern railway follows it fairly closely throughout. The river is navigable from Prince George to within about 25 miles of the south boundary of the Cariboo division. The points of call for steamers on this route are: South

Fort George, Fort George canyon, Mile 20, Woodpecker island, White's landing, Blackwater, Cottonwood canyon, Quesnel, Kersley, Australian ranch, Windt's, Castle Rock ferry, Twan's, Steamboat landing, Macalister and Soda Creek, the southern terminus of navigation. Below Soda Creek the Fraser is very tortuous until it is joined at Lytton by its great tributary the Thompson.

Quesnel is the business centre and principal settlement of this district. It lies on a bench on the east side of the Fraser and at the mouth of Quesnel river. The site is exceptionally favourable and the town very picturesque. It was established in 1808 and named after Jules Maurice Quesnel, a member of Simon Fraser's exploratory party who descended the Fraser river that year. In the gold boom days it became an important distributing centre for the Barkerville and other districts and attained a population of about 10,000. This has dwindled to about 800. The town occupies a geographical location about midway between the warm dry belts of the south and the colder plateaus to the north, and participates in the advantages of both. There is much good agricultural land in its vicinity, especially suited to dairy-farming, and the prosperous days of the mining régime may soon be restored by its development.

The main avenue of overland travel in the Cariboo district is the famous "Cariboo road," built by the Royal Engineers and miners under the instructions of Governor Douglas in the early sixties. From Ashcroft, on the main line of the Canadian Pacific and Canadian Northern railways in the valley of the Thompson river, this famous road runs north through the Bonaparte valley to Clinton, the centre of the Lillooet district and an important point on the Pacific Great Eastern railway. This part of the road is most prolific in rugged scenery. Above Clinton it climbs by a long, steep winding grade to the high plateau lands of the interior. North of Lac la Hache, the east shore of which it follows, it reaches the Cariboo division, 150-Mile House being the first important point within this division. Above this point the road soon takes a turn to the west and meets the Fraser river at Soda Creek, following its east bank north to Quesnel. The distance from Ashcroft to Quesnel by this road is 220 miles. Few such pioneer highways are to be found anywhere in the world. Though it runs through a sparsely settled and rugged country it is in splendid condition and offers a most serviceable and scenic route to the interior. Road houses are established all along the way for the convenience of the traveller though the present day method of travel is by motor-car. Stage cars, carrying passengers, mail and express make regular trips from Ashcroft to Quesnel or return often in a single day of ten or twelve hours.

This road is continued easterly from Quesnel to Barkerville, an additional 65 miles. Other roads lead out from Quesnel to Prince George, Fort Fraser, Quesnel Forks and Hydraulic, Chilcotin and White's landing. The grade of the Pacific Great Eastern railway passes close to Quesnel and it will doubtless be an important railway point. Steel has recently reached this point. Consequent alterations in systems of traffic and transportation are being adjusted. A through train service to the coast is now available.

Barkerville is located on Williams creek, in the Cariboo mountains. This little creek in its day has produced about forty-five million dollars in gold. At one time the population of the Cariboo was estimated to be 35,000, centering around Barkerville and Richfield. It has now dwindled away till Richfield is deserted and only a handful of miners are to be found at Barkerville. A little placer mining is still being carried

on and it is hoped the introduction of machinery will revive the industry, also that many quartz veins, known to be rich, will shortly be exploited. The completion of the Pacific Great Eastern railway will do much to revive mining in this section. The district is out of the agricultural limits, Barkerville having an elevation of over 4,000 feet above sea-level. Lightning and Antler creeks, in this region, have also become famous through their yields of gold. On Lightning creek are found centres at Wingdam, Beaver Pass and Stanley or Van Winkle post office.

Quesnel Forks and Hydraulic are also old mining centres in the Quesnel river district. They are reached by a wagon road from Quesnel. Beaver creek joins the Quesnel river at Beavermouth and in its valley are found some excellent agricultural lands. About midway up the valley is Beaver Lake post office and settlement. This point is also reached by wagon roads from Alexandria, Soda Creek and 150-Mile House, easterly via Quesnel and Cariboo lakes. Quesnel is a long, narrow lake, branching into two arms towards the east. Great numbers of placer claims are located about it in anticipation of hydraulic operations. Keithley Creek post office is located on Cariboo lake. Quesnel lake is also an extensive spawning bed for Fraser river sockeye salmon.

From the standpoint of possible agricultural development the Cariboo district might be considered under three divisions, namely, the Fraser valley and adjoining bench lands, the Chilcotin country to the west, and the Williams and Horsefly districts to the southeast. In these districts are found a wide range of climate, altitude and soil. On these factors will depend to a large extent the nature of agricultural activity best suited to the various localities. Ranching, dairy-farming and fruit-growing all have a place. Some sections have plenty of precipitation, while others require irrigating to get best results. Roughly speaking, the limit of the southern interior dry belt might be said to be reached at Soda Creek. Below this point the Fraser valley, as a rule, requires irrigation, while to the north it is not absolutely necessary though possibly a paying proposition.

The people who first came to the Cariboo district did so for the purpose of mining gold, not looking for farm lands or agricultural opportunities. Any other occupation than mining or such work as was directly and necessarily connected with it was not seriously considered. Hence the farming possibilities of the district were lightly overlooked. Such agricultural operations as were carried on by a few men in scattered localities were done so only in some form of connection with the main industry, mining, and not with a view to the permanency of the calling. Earlier farming efforts were in the same category as roadhouse keeping and freighting; in fact, from the old road houses, established at choice localities all along the roads, have evolved the best farmsteads of the district.

In the boom days as many as forty or fifty freight teams were constantly going up and down the Cariboo road. As each team consisted of four, six or even eight horses the business created by their presence can be easily imagined. A great demand arose for accommodation at frequent intervals along these routes for the many freighters, miners and travellers that thronged the way. With a view to securing this business, men selected choice locations along the road, erected commodious road houses and stables, cleared and planted vegetable gardens and oat fields and opened up large meadows for the production of supplies for their trade. Oats sold for from 2 to 4 and even as high as 6 cents a pound. Hay brought an equally profitable price, reaching

as high as \$120 per ton during the construction of the Grand Trunk Pacific railway. This has been the extent and style of farming indulged in heretofore. Indeed it could not well expand beyond such scope. The working of the mines and the building of the railway created a local market for a limited amount of supplies and beyond this there could be no expansion without favourable means of transportation to more extensive markets.

The old markets have practically failed, and the district has been experiencing a period of near-stagnation pending the establishment of new ones. Radical changes in the whole method of conducting both mining and farming operations are about to be experienced. The completion of the Pacific Great Eastern railway should save the situation. It will give a direct route to Vancouver and, by way of Prince George, to Prince Rupert and Edmonton. It would also appear that the short gap between Cinton and Ashcroft could be connected by steel to good advantage, thus giving more direct connection to the east and south. Instead of having the consumer come to the old road house on the ranch for his supplies, the ranch must now be prepared to revolutionize the whole system by shipping its supplies to the consumer.

The river bottoms and bench lands of the Fraser are admirably suited to dairy-farming. The climate is mild. Hay and clover grow most abundantly and the more broken areas on hillsides afford excellent grazing. Fruit-growing south of Soda Creek should prove profitable if the land were irrigated, while north of this point small fruits and potatoes do exceedingly well. Apples can be grown, though as a commercial undertaking alone would hardly be advisable. Strawberries grow to perfection.

North of Quesnel there is considerable good land on both sides of the river as far as Cottonwood canyon and the mouth of Cottonwood river. A wagon road and the railway grade follow the east side, running past 10-Mile lake, about which there is good land already surveyed. From Cottonwood canyon to Fort George canyon there is a narrow strip of good surveyed land. Blackwater, White's landing, Woodpecker island and Mile-20 are points of steamboat call in this section. West of the river there is some settlement about Boucher or 6-Mile lake on the Fort George road. Another road branches off here and leads into the Nazko valley, a tributary of Blackwater river. A trail extends from the end of this road southerly to the Chilcotin district.

The Blackwater valley is deep and narrow near its lower end and fairly heavily wooded. The bottom lands are very fertile and there are extensive plateaus of good land farther up on the Echiniko river, its tributary. A tract of 50,000 acres has been surveyed for pre-emption here.

Southeast of Quesnel is Dragon lake, about which lies some good land, lightly wooded, that could be cleared at a cost of approximately \$60 per acre. Along the Cariboo road, from Quesnel to Soda Creek, are found many old-time ranches. One of the choicest of these is the "Australian Ranch," on Australian creek. It consists of some 1,200 acres, of which 300 are cleared and irrigated. Another 300 might be added, the balance being hilly and broken but comprising good pasture land. Kersley, Alexandria and Macalister post offices lie along this section. A number of creeks enter the Fraser on the west side opposite this section, of which the principal are Baker, Deserters, Narcosli and Mackin. They have sufficient flow to irrigate considerable land, of which several small areas are found in these valleys.

While the choicest lands are usually found in the bottom of the valley, there are large areas of good bench lands. Of those surveyed it has been estimated that about



A real farm in Central British Columbia.



A picturesque homestead at François lake, British Columbia.

one-third, on an average, is suitable for cultivation, that is, the average 160-acre lot will give about 50 acres of good tillable land, while the balance will be mostly available for pasture and what is left will produce wood. These benches are well watered, but subject to summer frost. Hay and oats do exceedingly well, so that such farms are good for dairying and small ranches. Cattle will require feeding for three to four and one-half months here during the winter. Vegetables and small fruits do well, but wheat, apples and similar cereals and fruits only fair to uncertain.

Taking the Quesnel district as a whole it appears to be most particularly suited to dairy farming. The climate is very agreeable and dairy cattle thrive exceptionally well. The summer pasture is plentiful and nutritive, water pure and plentiful, and the choicest hay, clover and oats can be grown in abundance for winter fodder.

In the southeasterly part of this division there is a large district that promises to prove exceedingly valuable for stock raising. It extends from Williams lake on the Cariboo road easterly to Horsefly lake, which lies a few miles south of Quesnel lake. Williams river flows northwesterly from Lac la Hache, through Williams lake, and enters the Fraser a few miles below Soda Creek. The Cariboo road and railway grade follow it closely. Williams Lake post office and 150-Mile House are in the centre of this section. A number of roads run northeasterly to the Horsefly district in which the principal settlement is centered about Harper's Camp. The range in the Horsefly district is said to be very good but it is considered too elevated and frosty to make an agricultural country. About Williams lake mixed farming could probably be successfully carried on. Horses, cattle and sheep are reported to do well in these sections.

The famous Chilcotin ranching district lies west of the Fraser river in the southern part of the Cariboo and the north part of the Lillooet divisions. It comprises a vast elevated plateau extending from the Coast range of mountains easterly. It is cut with numerous deep valleys, the principal of which is that of the Chilcotin river. The bottom lands of these valleys are very fertile and, when irrigated, produce prolific crops of all varieties of grain, grass and fruits common to the province. The upper lands are fairly open, with numerous natural meadows, but, on account of their elevation, are subject to summer frosts. Added to this drawback is the light precipitation prevailing, which has caused these plateaus to be rejected as farming lands and devoted only to ranging. The climate is comparatively mild, cattle requiring winter feeding for an average of two and a half to three months only. With its numerous meadows, mild climate, good range and sufficient lakes and streams to provide water for drinking purposes this district has attained great success in ranching.

The Chilcotin district is reached by a main road from 150-Mile House, which passes around Williams lake and crosses the Fraser river on a bridge at Chimney Creek and follows westerly along the Government telegraph line. Trails also lead in from Soda Creek and Nazko river. Another road enters from Clinton, while a trail following the telegraph line gives connection with Bella Coola on the coast. The principal centres in this part of the district are Alexis Creek and Redstone. The main tributaries of the Chilcotin are the Chilanko and Chilko rivers, which rise in the Tatla and Chilko group of lakes. One mountain peak, the Anahim, with an elevation of over 6,000 feet, stands out as a striking landmark visible from nearly every part of the Chilcotin plateau.

As a range country the district is already sufficiently, if not excessively, stocked, but it is believed that by practising dry farming methods large areas of range land could be made more profitable. It is possible that the adoption of such methods will result in much of the district being brought under cultivation and being more thickly settled.

THE FORT FRASER DISTRICT

The Fort Fraser Land Recording Division includes the drainage area of Nechako river, except for the last few miles of the river's valley, which are within the Fort George division. The Nechako is the main branch of the Fraser in the central interior part of the province. Flowing from the west it drains the great areas of fertile plateau lands that gently fall away from the summit of the Cascade or Coast range of mountains. At Prince George it joins the main branch of the Fraser, which, rising in the Rocky mountains, flows in an opposite direction through an ever-widening valley of rich lands and valuable woods. Meeting from these opposite directions, the waters now flow southerly to join the sea at Vancouver, which lies almost due south of Prince George and nearly 325 miles distant in an air line.

The Fort Fraser division is traversed by the Grand Trunk Pacific railway from west to east midway between its northern and southern boundaries. Commencing at Rose Lake, on the summit between the Skeena and Fraser watersheds, or more locally between the Bulkley and Endako rivers, the railway follows the latter river easterly to Fraser lake, thence skirting the south shore of this lake it crosses the Nechako, which flows from the south to almost enter the lake at its eastern extremity. The Nechako now swings east and the railway follows its south bank to Prince George.

Midway between Fraser lake and Prince George the Stuart river joins the Nechako from the north. This point approximately defines the easterly limit of the Fort Fraser Land Division. It extends northerly to the Arctic-Pacific divide, westerly to the Skeena-Fraser divide, and southerly to the height-of-land parting the drainage area of the Nechako and its tributaries from that of the Dean and Blackwater. Its boundaries are very irregular, but its average dimensions are nearly 125 miles east and west by 150 miles north and south. This area probably contains more agricultural and grazing lands than any other of equal extent in British Columbia.

Before the completion of the Grand Trunk Pacific railway this splendid district was without means of transportation and was therefore unsuitable for extensive settlement purposes. Its favourable climate, highly productive soil and general qualities that are essential to a successful agricultural country have long been known. Fort Fraser, at the east end of Fraser lake, and Fort St. James, at the east end of Stuart lake, were established as trading posts by the Northwest Company in 1806. The diaries of resident officials of this, and later of the Hudson's Bay Company, bear ample testimony of the success attained in limited horticultural and agricultural undertakings conducted about these posts. Many entries also comment in glowing terms on the future possibilities of the district at large along such lines. The inaccessibility of the district, and the absence of markets even if settlement were forced, have held back this large area—and possibly fortunately—from earlier exploitation.

Along the Grand Trunk Pacific railway from west to east the country falls into three natural local divisions, namely, the Endako valley and Burns lake district, the

Fraser lake district and the Nechako valley district. North of the railroad there are two principal sections worthy of special mention, the Stuart lake district and the Babine lake country. Immediately south of the railway are found two other choice parts, namely, the François and Ootsa lakes district and the upper Nechako valley. Still farther south and on higher altitudes are some good grazing districts about Cheslatta lake, Entiako river and Eutsuk lake. The southwest corner of the Fort Fraser division extends to near the Blackwater divide and includes the upper valley of the Chilako river.

The Endako valley and Burns lake district contains some good farming and grazing lands adjacent to the railway. Endako river has its source on the summit at Rose lake, and flowing easterly passes through Decker and Burns lakes. The station of Palling is located above the head of Decker lake, practically on the ridge between the Endako and Bulkley rivers. There is a little good land here and more of a light and gravelly nature. Decker Lake station is located about midway along the north shore of this lake and to the north and west is some fairly good land, lightly wooded with poplar and jackpine, open for settlement. At Burns lake a townsite was surveyed and sold in 1917. It is expected this point will become the distributing centre for the Fraser and Ootsa lakes district and the Babine lake country, wagon roads leading out in both directions. Very rich black alluvial soil with clay subsoil is found about Burns lake and vegetation is very profuse. From Burns lake to Endako the bottom lands of the valley consist of a rich black loams with rank vegetation. On the benches the land is usually lighter but free from stones. Endako is a divisional point on the railway and the town is growing rapidly, the surrounding land being now nearly all settled on. Endako river empties into Fraser lake a few miles east of this point. The total length of this river, from Rose lake to Fraser lake, is about 50 miles. The valley proper does not average much over a mile in width, but the low bench lands extend considerably back on either side.

The Fraser lake district contains an area of good agricultural land, estimated at 15,000 acres, together with much rough land suitable for grazing. Most of this land lies south of the lake, but good land with a uniform settlement extends all around the lake. The soil is a white clay silt, with vegetable loam, and is very fertile and easy to till. Fraser lake is about 12 miles long and 2 miles wide. The Endako and Stallako rivers enter at its western extremity. A short outlet, the Nautley river, at the eastern end, drains into the Nechako. The railway and a wagon road follow the south shore, while the old government telegraph line follows its north shore. The old trading post of Fort Fraser is located at the northeast corner of the lake and is about 5 miles distant from the new townsite and railway station of Fort Fraser. A wagon road connects them. The land recording office for this division is located at the new town. For over one hundred years land in this vicinity has been cultivated and the productiveness of the district has been amply verified. About this lake are located many "old-timers," who found their way here in connection with the fur trade, the building of the Government telegraph line, or later with the survey and construction of the Grand Trunk Pacific railway. The attractions of the district induced them to settle, in spite of the certain long wait for development.

The Nechako valley, extending along the railway from Fraser lake to Prince George, and especially that part above the mouth of Stuart river and within the Fort Fraser land division, constitutes one of the largest and best single areas of farm lands

to be found anywhere in the province of British Columbia. The Nechako river has its source in Nataalkuz and Cheslatta lakes. It flows in a northeasterly direction for about 70 miles to the east end of Fraser lake, then turns easterly and flows for about 100 miles to join the Fraser at Prince George. It has a strong swift current and is quite deep, with an average width of some 400 or 500 feet. Before the completion of the Grand Trunk Pacific railway it was navigated by steamboats as far as Fort Fraser, and light-draught boats have been run for 20 miles above this point. With slight river improvements it is believed this run could be extended some 35 miles farther up stream.

On both sides of the river the valley gradually rises and spreads out into a vast gently rolling plateau, extending northerly to Stuart lake and southerly to the Blackwater divide. Its average elevation is about 2,400 feet. The surface is gently rolling, well watered and well drained by numerous small streams. Several small lakes are also found, of which the principal are Tachick, Nulki and Sinkut, lying a few miles south of the railway. Fifteen or twenty years ago this plateau was more open than at present, much of the surface having recently been covered by a light growth of poplar, spruce and black pine. On the whole, it is now lightly wooded with many meadows and small patches of prairie occurring. Most of the trees will average from three to five inches in diameter, with a few of large dimension. This plateau very much resembles the "park lands" of the Prairie Provinces. The advantages derived from the shelter it affords are considerable, while the yield of firewood, fencing and building material is of no small value to the settler.

The soil of the whole district is uniformly rich, consisting of a deep deposit of silt mixed with a chocolate loam, extending from five to thirty feet deep and resting on a clay subsoil. This silt is believed to be the remains of a pre-historic lake bed which once covered this area, and is exceedingly rich. The whole is further enhanced by the presence of decomposed vegetable matter.

The climate of this district is very favourable and the precipitation sufficient for successful farming. The winters are fairly cold, but not severe, bright and comparatively free from winds. The snowfall is medium. The summers are noted for long bright days and cool nights. Summer frosts are rare and disappear as the land is cleared up.

The clearing of the land has been found to average about \$12.50 per acre, including stumping. Good unimproved lands may be purchased at prices varying from \$15 to \$25 per acre. A number of improved farms are also listed for sale. Area No. 2 of the Land Settlement Board is located to the north of Vanderhoof.

This district is fairly well served by roads, which are being extended year by year. The river is bridged at Vanderhoof. Easterly from Fort Fraser the railway stations are Marten Lake, Engen, Coll, Vanderhoof and Sinkutt. The principal centre of the Nechako valley is Vanderhoof. To the south lie Sinkutt lake and Mapes on the telegraph line, and a few miles north of the river is Chilko settlement and post office. A wagon road runs northerly from Vanderhoof to Fort St. James and southerly to Sinkutt lake and thence along the telegraph line. Roads from Fort Fraser also lead southeasterly to Sinkutt lake. In this district there is considerable good unimproved land for purchase and some open for pre-emption. The Land Settlement Board is placing a number of returned soldiers on the land, and there is now quite an influx of new settlers. The district is pre-eminently suitable for dairy farming and small

ranching. A ready market is available for all such produce. In the town of Vanderhoof are found all the requisite places of business necessary for the convenience and trade of the district. A board of trade here is alert to the future welfare of the valley, and intending settlers or those interested in this locality cannot do better than write the secretary for desired information.

The Stuart lake district is an extension, in a northerly and westerly direction, of the Nechako district. It contains very similar lands, equally valuable except for the lack of railway facilities, and has the advantage of containing much larger areas open for pre-emption. The centre of this district is Fort St. James, a Hudson's Bay post, established by the Northwest Company at the southeast end of Stuart lake, in the year 1806. A wagon road 38 miles long connects it with Vanderhoof. There is also a trail to Fort Fraser, a trail to Fort MacLeod and a trail to Manson Creek. The two latter cross the Arctic-Pacific divide to the upper Peace River district.

The Stuart lake country is very extensive and includes three large lakes, Stuart, Tremblay and Takla, connected by the Tache and Middle rivers and forming a continuous chain of waterways extending for 100 miles northwest from Fort St. James. This area is drained by the Stuart river flowing through a wide valley from Fort St. James to the Nechako river. The Necoslie river occupies part of the same valley and, flowing from an almost opposite direction, curves around and joins the Stuart at the outlet of the lake. The two are practically one and the same river, draining the lake at this sharp bend. Navigation is possible on these waterways for boats of considerable size, a 70-foot steamer having ascended from Quesnel during the boom days of the gold rush.

It is estimated that there are many hundred thousand acres of first-class arable land in the Stuart basin. Areas suitable for grazing are more extensive, and while no definite estimate can be made without more complete data being secured, there is no doubt that scattered locations are to be found all the way to the Manson and Parsnip valleys and thence to the Peace. A branch line from the Grand Trunk Pacific railway would be of inestimable value in opening up this district, and there is no question that its development under present circumstances will soon warrant its construction. Many returned soldiers are taking up land here.

About Babine lake there is also a large tract of good agricultural land and large areas admirably suited to ranching. Much of the country is fairly open and level or gently rolling. Wild grasses and peavine grow most profusely. Stock would require winter feeding here on account of the snowfall, which is rather deep.

The southern end of Babine lake is reached by an old trail from Fort Fraser, following the Beaver or Sutherland river. A twelve-mile wagon road leads across the portage from this end of the lake to Stuart lake, on which freight teams are maintained by the Hudson's Bay Company during the summers. Another road leads to Babine lake from Burns lake. The old Hazelton-Omineca pack trail also touches the lake at Fort Babine at the extreme northwest end. This lake is about 100 miles long and parallels the Babine range of mountains which lies to the west of it. It drains by the Babine river into the Skeena above Hazelton.

The François-Ootsa lakes district is now attracting the attention of stockmen particularly. It occupies an undulating plateau, with an average elevation of about 2,800 feet, is dotted with lakes, and has scattered ranges and peaks rising from 500 to 1,000 feet above the lake levels. Around these numerous lakes are found rich arable

lands and many benches and gently sloping hillsides, which are lightly wooded and covered with grass and peavine. Other parts have heavier woods with open grassy areas intervening.

A good wagon road 14 miles in length leads south from Burns lake, on the Grand Trunk Pacific, to François lake. This lake is about 55 miles in length and 2½ miles wide, running in an east and west direction. The road meets it about midway on the north shore. A ferry crosses the lake here and the road continues southerly some 24 miles additional to Ootsa lake. This lake is also long and narrow, measuring about 45 miles by 3 miles; it lies in a partial crescent, the eastern part swinging somewhat to the south. The road reaches its north shore also about the centre.

The west end of François lake is reached also by a wagon road from Houston and the east end by roads from Endako, Stellako and Fraser lake. On the north shore of François lake are located François Lake and Colleymount post offices, connected by road. The Houston road passes the west end of this lake and runs south to Wistana on Ootsa lake, then turns east and joins the Burns lake road. Branches lead to the head of Cheslatta lake and to various localities throughout this district. Some of the principal settlements are found about Skins, Spencha, Takysic, Uncha, Mollice, Tata-laska, Bickle, Tatalrose and Spud lakes between François and Ootsa lakes and about Tchesenkut lake to the north. Bickle and Ootsa Lake post offices are located between these two large lakes.

This district promises to develop rapidly into a first-class area for mixed and dairy-farming and small ranching. Its climate is moderated to some extent by warm breezes, which find their way through the Coast range of mountains.

Eutsuk lake lies to the southwest of François and Ootsa lakes and might be included as part of the same district. It has a similar form, and its surrounding country is much the same, though reaching a higher altitude and being farther distant from the railway. Cheslatta lake lies between the eastern ends of François and Ootsa lakes and forms part of the source of the Nechako river. The lands about it are slightly rougher than between these lakes but contain small scattered areas of good land and some meadows. Similar country is found about the Entiako river and the upper reaches of the Nechako.

The Chilako valley forms part of the drainage basin of the Nechako river, into which it empties only a few miles above its confluence with the Fraser. Most of this valley is included in the Fort George land division, the upper reaches only being in the Fort Fraser division. The bottom lands, though not extensive, are exceedingly rich, while the benches and plateau at the head are most prolific in wild grasses. The district has been burnt over and now has many large patches of prairie meadows and lightly wooded areas. The government telegraph line between Quesnel and Fort Fraser crosses this valley near its southern limit.

The Fort Fraser Land Division stands out pre-eminently as an agricultural country. In all the other divisions of Central British Columbia the predominating industries are fishing, mining or lumbering, with agriculture taking an inferior place. Here the lands appear to be the greatest resource, and their development along dairy-farming lines would appear to have most enticing possibilities.

THE HAZELTON DISTRICT

The Hazelton Land Recording Division lies immediately east of the Skeena division, and includes all the upper drainage areas of the Skeena river. It is a somewhat mountainous division but also contains several rich agricultural valleys and plateaus. The Coast range of mountains forms its westerly limit, dividing it from the Skeena division. The Boundary line between these land districts crosses the Skeena river and Grand Trunk Pacific railway at Copper City, a few miles east of Terrace, the centre of the Kitsumgallum-Kitimat valley. Northerly the Hazelton district extends to Skeena-Stikine divide and northeasterly to the Skeena-Omineca divide. Along the Grand Trunk Pacific railway it extends as far east as Rose lake, the height-of-land between the Skeena and Fraser river drainage basins. This height constitutes its easterly and southerly boundary.

Within this division lies the main valley of the Skeena river from Copper City to Hazelton. Its principal tributaries in this section are the Copper and Kitwanga rivers. At Hazelton the Skeena valley becomes divided, the river forking in opposite directions. The main river flows from the north, while the Bulkley here joins it from the southeast. A few miles above these forks the main branch is joined by the Kispiox and farther up by the Babine.

At Copper City there is a small settlement connected with the railway by a ferry and with Terrace by a wagon road. Small fruits and vegetables thrive here. The climate is mild and this section might be included, for descriptive purposes, with the Kitsumgallum-Kitimat district. Limited areas of good land are found on flats and benches along the Skeena but are not extensive. The soil, however, is exceptionally good, the climate mild and the moisture ample but not excessive. Such areas are admirably suited to fruit growing and truck and dairy farming, and have the advantage of rail and river transportation close at hand.

The Kitwanga valley contains some excellent lands with a considerable settlement. In addition to fruits and vegetables, hay and grain are grown and live stock raised. A wagon road leads up the valley for a few miles, thence a trail crosses the divide and follows down the Cranberry river to the Nass. The pre-emptor map of 1919 shows several lots open for settlement in this valley.

Hazelton is a name romantic in the annals of the mining activity of Central British Columbia. For long years it was the animated gateway to the famous Omineca district. Skeena river steamboats, after battling their hazardous voyages up the numerous rapids of this turbulent waterway, here discharged their cargoes of supplies for the placer camps of the interior. The busy scenes, as miners and packers outfitted for the long strenuous march over rugged hills and through deep valleys, with their beasts of burden following in patient procession, have now almost vanished. Fort Babine, Bulkley House and Fort Connelly are now listed as abandoned. The days of the gold boom have passed, though there is still a little traffic over the old route from this point to the Omineca gold-fields. Hazelton still continues, in a lesser way, to be the centre of prospecting and mining activity for the district, and high hopes are entertained that if the placer mines fail to restore the former activity the coal and quartz mines will do so.

There are some good agricultural lands in this vicinity, particularly in the lower twenty miles of the Kispiox valley. A wagon road extends about 40 miles up from Hazelton and a pack trail leads farther up. The valley of the Skeena is narrow but there are some good bench lands between the Skeena and Kispiox. All grains, grasses and vegetables grow well here, and the district is well suited to mixed or dairy-farming. The Ashcroft-Yukon telegraph line passes through Hazelton and follows the Kispiox valley.

Hazelton is located in the flats at the junction of the Skeena and Bulkley. Hazelton station, on the Grand Trunk Pacific railway, which here follows a high bench on the south side of the rivers, is about a mile distant. New Hazelton is another station on the railway about 6 miles east. Near the junction of the Kispiox with the Skeena is the old village of Kispiox. Much of the best land in this vicinity is held under Indian reservation.

The Skeena, Kispiox and lower Bulkley valleys, in the vicinity of Hazelton, have an average elevation of about 1,000 feet above sea level. Hazelton is quoted as 973 feet, New Hazelton as 1,030 feet, and the Bulkley about 1,500 feet. The climate is fairly mild, and summer frosts rarely, if ever, prevail. Some excellent irrigated gardens are to be seen in the bottom lands of the valleys, but the moisture, as a rule, is sufficient for ordinary purposes.

The principal section of the Hazelton land division, from an agricultural standpoint, is the famous Bulkley valley. It lies on an elevated plateau between the Babine range of mountains on the east and the Telkwa and Hudson Bay mountains of the Coast range on the west. It is drained by the Bulkley river, which has its source in Rose and Bulkley lakes, on the Skeena-Fraser divide, and, after flowing in a general northwesterly direction, joins the Skeena at Hazelton.

The Bulkley is a swift river, with many rapids and canyons, especially near its mouth. The elevation of Rose lake, on the Grand Trunk Pacific, is 2,363 feet, while that of Hazelton is 973 feet. The railway closely follows the river throughout the entire valley. Rose lake is 300 miles east of Prince Rupert and New Hazelton 180 miles, so that the length of the Bulkley river is thus approximately 120 miles. In this distance its fall is 1,390 feet, an average of 11 feet to the mile.

The Bulkley valley thus becomes more of a plateau, with an elevation varying from 1,550 feet to 2,350 feet. Its width will average from 5 to 15 miles, with hillside grazing lands beyond.

The woods of the Bulkley valley are smaller than those of the Skeena and consisted years ago mainly of spruce. Much of the district has been burned over and is now made up of open patches interspersed with willow, small second-growth poplar and jack pine and some small stands of old spruce. A couple of saw-mills are operated in the district, but there is no lumber available for export. The soil varies considerably and mainly according to difference in elevation. The lower lands are uniformly rich, consisting of river silt, sandy loam and clay subsoil. The benches are more variable, some consisting of poor gravelly soil while others have a very rich clay loam. The clearing of the land is comparatively easy, and will cost probably from \$15 per acre up. The timber is sufficient at present for local use.

Speculators have held land idle in this district for several years, but the policy of the Government in taxing wild lands and compelling owners to put certain per-

percentages under cultivation or suffer it to be expropriated, and also the demands of the Land Settlement Board for lands for returned men, are having the effect of forcing much of it on the market. The average price asked for these unimproved lands in 1919 by local agents was \$12 per acre. Settlement areas Nos. 1, 6 and 11, administered by the Land Settlement Board, are in the Bulkley valley.

The principal centre of the district is Smithers, a divisional point on the railway, and now the seat of the Land Recording Office for the Hazelton division. It is a new railroad town but is growing rapidly; it has good hotel accommodation and well-established mercantile houses. Its adjacent farming district lies to the north and east, on the opposite side of the river, where good roads lead through some very fine farms and ranches. The Bulkley river is spanned here by a good traffic bridge.

Between Smithers and Hazelton are Lake Kathlyn, Evelyn, Doughty, Moricetown, Seaton, Beament, Bulkley Canyon and New Hazelton. At Lake Kathlyn the valley is seven or eight miles wide, four miles of which lies on the west side of the river. At Moricetown it has narrowed down to about half this width and is broken and rough. The main road, which traverses the valley from its head, crosses here from the east to the west side of the river. The northern end of the valley is narrow and rough. At Bulkley canyon the Suskwa river enters from the east. The Hazelton-Manson Creek trail follows its north bank.

Between Smithers and Rose Lake, at the head of the valley, are found many choice settlements where agricultural operations have been successfully carried on for years. Telkwa, ten miles south, is one of the best-known centres of this valley, and in its vicinity are to be seen some of the choicest lands and best improved farms of the Bulkley, especially around Maclure lake. Tatlow is a station between Smithers and Telkwa and is also located in the midst of a good farming section. Hubert is the next station south of Telkwa and it also has a good country surrounding it. The valley here attains its greatest width, and about Lacroix lake, which lies a couple of miles east of Hubert, are found some of the old-established ranches of the valley. Quick, the centre of Land Settlement area No. 1, is the next station. South of this the valley is narrower, and below Barrett lake it makes a big bend, assuming a more general east and west direction. Walcott and Barrett stations are located north of the bend, the latter being connected by a wagon road with Barrett lake, a couple of miles distant, where other large ranches are located. Good range land is found here, and to the south are some choice agricultural lands with southwestern slope.

Morice river and Buck creek enter the Bulkley from the south at the big bend, Houston being located at the mouth of the latter. The valleys of both these tributaries for a few miles contain some good bottom lands with hillside grazing areas. From the Morice to a few miles above Houston is Pleasant Valley or North Bulkley, a particularly choice section of the Bulkley.

The valley then becomes narrow, the elevation increases, and the good lands are confined for the most part to alluvial flats and scattered patches on the benches. Less open land is found and lighter soil occurs. The principal settlement in this upper part of the valley is about South Bulkley. The railway station here is Forestdale. Between Houston and South Bulkley are Knockholt, Perow and Topley stations and to the east Rose lake, at the summit of the valley, and on the easterly boundary of the Hazelton land division.

The Bulkley valley is traversed throughout by the Grand Trunk Pacific railway and a main wagon road with several laterals and cross-roads, and also by the Ashcroft-Yukon Government telegraph line. As the valley is long and narrow all parts enjoy these advantages. The climate is colder than on the Skeena, with more snowfall, and the winters are longer, though not severe. The summers are pleasant, and rainfall sufficient, but summer frosts occur in places. These are believed to be ceasing as the land becomes cleared up. Taken as a whole, the valley is most suited to mixed and dairy-farming or ranching where sufficient range is available.

Aside from these pursuits mining is the principal industry. The silver-lead deposits west of Smithers and the coal-fields west of Telkwa are believed to be rich and extensive. The development of these and other prospective mines will do much to increase the demand for farm products and provide an ever-increasing local market. This district promises to develop rapidly.

THE SKEENA DISTRICT

The Skeena Land Recording Division, with recording office at Prince Rupert, includes nearly all the coast lands of Central British Columbia, that is, the area lying west of the Coast, or Cascade, range of mountains, which forms its eastern boundary. On the north the divide, between the Stikine and Naas watersheds, in approximately latitude 57, is its boundary, while on the west it is limited by the Alaskan boundary. Portland canal and the main coast. Southerly the division extends to Millbank sound. Between this body of water and latitude 52 is found the Bella Coola district, which rightly belongs to Central British Columbia. It falls within the Vancouver land division, but for purposes of description is included with the Skeena division.

This district cannot be called, by any stretch of the imagination, an agricultural one. It is mountainous and rocky, and is broken up by numerous irregular inlets from the Pacific ocean. Many of the mountains rise even above timber line, and sufficient soil for agricultural purposes is found only in the bottoms of the narrow valleys. These are most heavily wooded. The climate also is unfavourable for ordinary agriculture, being mild but excessively wet.

However, there are found in this district certain sections which prove exceptions to the general rule and as such have an enhanced value. Where such favourable conditions are found produce is grown in plenty, and ready markets are always at hand. Lumbering, fishing and mining have reached a higher stage of development here than in any other part of Central British Columbia, therefore the limited areas of favourable agricultural lands which do occur are of more than ordinary importance.

The Bella Coola valley is about 40 miles long, having a width of about 3 miles at its mouth and half a mile at its upper end. Steep mountains hem it in on both sides, and valley and mountain sides have been heavily wooded. The soil is uniformly good, being a sandy loam and well adapted to the production of small fruits and potatoes. Vegetables and hay are also grown abundantly. The climate is mild and very pleasant, zero weather being seldom encountered.

Bella Coola town, at the outlet of the valley, is a port of call for coast steamers, and is provided with the usual places of business. It also has connection with the

interior by a telegraph line running up the valley and across the Chilcotin country to tap the Dominion Government's Ashcroft-Yukon wire on the Cariboo road. A wagon road extends about 35 miles up the valley beyond which a trail follows the telegraph line. Other centres of settlement are Hagenburg, 12 miles up; Sloan, the center of an Adventist colony, 30 miles up, and Atnarko, near the head of the valley. The lands have all been taken up for some time. Many Norwegians have settled here and engage in fishing as a side line. A couple of saw-mills are also operated. Bella Coola has the distinction of being the point at or near which Alexander Mackenzie, the first white man to cross the continent, reached the waters of the Pacific ocean in 1793.

The Skeena valley, from the Coast mountains to the sea, is also a narrow valley and contains only a limited amount of agricultural land. It has splendid transportation advantages, however. The Grand Trunk Pacific railway follows the north shore of the river through this entire division. Tide-water extends up about 20 miles and the lower reaches are navigated by small coast boats. In the early days of mining activities in the Omineca, steamboats plied as far up as Hazelton, well beyond the Coast range. Port Essington is located at the mouth of the river, while Prince Rupert, the Pacific terminus of the Grand Trunk Pacific, is located on Kaien island, practically in its delta.

A number of islands, formed by river silt and sand, and flats and benches of varying extent, constitute the agricultural lands of this section. They are found in irregular areas and scattered locations. Most of the best land is, or has been, heavily timbered, but it is now nearly all taken up. The climate is mild and the rainfall heavy at the coast, but it gets colder and drier ascending the valley. Vegetation is rank but ripens slowly.

An area with greater possibilities along agricultural lines is that found in the valley of the Nass. This river has its sources well up in the Cassiar district, and flows in a general southerly direction to latitude 55, when it turns west and reaches the sea at Nass bay on Portland inlet. It is enclosed by mountains on the north, west and east, and the greater part of its arable land consists of elevated plateaus, rising in series as the stream is ascended. The lower part of the valley is narrow, from one to three miles wide, as far up as Ayansh village. Above this point it widens out to eight or nine miles and thence rises into extensive plateaus.

The principal settlement is between Upper Nass and Cranberry river. At Ayansh there is an Indian reserve covering about 2,000 acres. This district has been burned over and now contains many open meadows and areas covered with second-growth woods. Wild grasses and peavine grow abundantly. Soil and climate are favourable to the production of small fruits, vegetables, hay and grain. The district is admirably suited to fruit-growing, dairying and truck and mixed farming.

At present the greatest obstacle to settlement is its lack of transportation facilities. Steamers call at Nass Harbour and gasoline launches give an irregular service from that point from May till November. The upper valley is also reached by trail from Terrace, on the Grand Trunk Pacific railway, by way of the Kitsumgallum valley, and from Kitwanga by way of the Cranberry and Kitwanga rivers. There is a store and post office at Upper Nass, also a telegraph office giving connection to Granby Bay and Stewart. The Dominion Government telegraph line from Ashcroft to the Yukon crosses the height-of-land from which the headwaters of the Nass have their origin.



A trapper's cabin on the bank of Parsnip river.



Mount Robson, the highest of Canadian peaks, from Grand Trunk Pacific Railway.

Adjacent to this territory are found extensive mining, fishing and lumbering activities. Thousands of men are employed in the mining industries of Granby Bay, Anyox, Alice Arm and Stewart. With means of delivering their products promptly and cheaply to these centres the settlers of the Nass district should find adequate and profitable markets for their output.

One of the most attractive rural districts of Central British Columbia, especially to the lover of fruits and flowers and their cultivation, is the Kitimat-Kitsumgallum valley, or, as it is becoming more commonly known, the Terrace strawberry belt. This little section has a most unique location, and is almost a small world of its own. It lies in a narrow trough of the Cascade mountains and almost at right angles to the valley of the Skeena river, which it crosses at a point centering on Terrace, a small station on the Grand Trunk Pacific railway, 94 miles east of Prince Rupert.

Here the Kitsumgallum river, flowing southerly through its trough-like valley walled in by snow-capped peaks of the Cascades, joins the Skeena. Its main source is Kitsungallum lake, a beautiful body of water some six miles in length and distant about fifteen miles from the Skeena. At the head of the lake is Rosswood settlement. Cedar river flows into the north end of the lake from a low divide in the valley which separates the tributaries of the Skeena from those of the Nass. North of this low divide is found Lava lake, which is drained northerly through a continuation of the Kitsungallum valley by the Tseux river into the Nass, reaching it at Upper Nass or Ayansh. A further low divide extends the valley across the Nass and to the head of Alice Arm.

From Terrace south the valley continues some ten miles to Lakelse lake, another beautiful mountain lake hemmed in by snow-capped peaks. This lake is drained by Lakelse river, which enters the Skeena a few miles below the mouth of the Kitsumgallum. From Lakelse lake a low divide leads south to the Kitimat river, which, in turns, drains through a deep valley into Kitimat Arm.

From the head of Cedar river to Kitimat Arm, which will include the Kitsumgallum-Kitimat valley proper, the distance is roughly some 70 miles, of which about 35 lie to the north and 35 to the south of the Skeena river. The total length of the trough from Alice Arm to Kitimat Arm is between 75 and 100 miles.

The width of the valley varies from three to six miles. The main valley of the Kitimat is four or five miles wide and about six at its mouth. The Kitsumgallum flats are narrow but the bench lands will keep up the average width. The soil of the lower lands is exceedingly rich, while much on the bench lands is also good, though some is sandy and gravelly. The valley has been heavily wooded and much is still in timber, being principally hemlock. A saw-mill is operated at Terrace and cuts logs secured in this locality.

This valley is made of particular value by its salubrious climate. It is just far enough east of the coast to be out of the wet belt without finding itself in the dry belts such as occur in the southern interior. The rainfall is sufficient for ordinary purposes of agriculture, while the amount of sunshine received is most abundant. Sea breezes blow up and down the valley from Alice Arm at one extremity to Kitimat Arm at the other and play a most important part in maintaining a uniform temperature. The proximity of the mountains also serves to temper the heat by

summer and give shelter by winter. The winters are very moderate, the thermometer seldom falling below zero, while the snowfall is not excessive. Rainfall in summer is usually ample but the valley lends itself readily to irrigation should such become necessary.

This valley has been found to give most marked success in small fruit growing and has already attained considerable fame through its production of strawberries. The season for this fruit is later than in almost any other section of North America and thus the producers find a ready market for these berries after other sources have been exhausted. This fruit attains a splendid size and has a delicious flavour. Daily shipments during the season are made westerly to Prince Rupert and easterly to Edmonton, Saskatoon, Winnipeg and other prairie points. Raspberries, currants and gooseberries appear to do equally well. Apples, plums, pears, cherries and kindred fruits may be raised with equal success, though such trees are only beginning to bear, as the district has not been long enough under way to give them a fair trial.

The land here is nearly all divided into 10-acre plots. The average price at which it can be purchased is about \$75 per acre and the cost of clearing will average possibly \$150 per acre. At this rate a 10-acre plot would cost \$2,250. If planted to strawberries additional cost would be incurred and a wait till the second year for a crop become necessary. However many one-acre plots of strawberries in this section have yielded from \$500 to \$600 each in a single season. Settlers here are doing exceptionally well and the valley is being rapidly filled up. The small farms give a more thickly settled community than in the case of ordinary farming and the advantages of good roads and closeness to town and railroad are enjoyed by all. The lower end of Kitimat valley is served by coast steamers.

Poultry-raising and dairying are other pursuits that can be successfully carried on in this valley, the city of Prince Rupert providing a never-failing market for such produce. Bee-keeping might also prove remunerative. The streams and lakes of the district afford excellent fishing, trout being most plentiful. The Dominion Government maintains a hatchery on Lakelse lake. The mountains afford excellent hunting, while the mineral deposits of the vicinity are believed to be extensive and valuable.

Another attraction of this district are the hot springs found at the southern end of Lakelse lake. These have been exploited to a very limited extent only. They are believed to possess excellent medicinal qualities, and it is altogether probable that a sanatorium or resort will be established here which will become very popular and beneficial.

Already this district is becoming a popular holiday resort for the inhabitants of Prince Rupert, who find in its high altitude, lighter and brighter atmosphere, and its many attractions of fruit, flowers and scenery, hunting and fishing, hot springs bathing and mountain climbing, a most complete recreation ground. Its attractions, both as a temporary and permanent place of residence, are many and varied, and will doubtless result in an ever-increasing influx of pleasure, health and home seekers.

AGRICULTURAL AND INDUSTRIAL OPPORTUNITIES

The building of the Grand Trunk Pacific railway has made available great tracts of fertile lands unsurpassed in any part of western America for dairy purposes. This railway was completed in 1914, and, while agricultural settlement and development has advanced since that date, it has not made the rapid progress that was expected of it. This is no doubt due to the retarding influence of the war, which put a stop to European immigration and retarded development work generally.

Now that conditions are becoming normal and more men, including large numbers of ex-soldiers, are seeking new land, a marked activity in rural development may be expected. Increased service on the Grand Trunk Pacific and Canadian National railways is already in evidence, while the building of the Pacific Great Eastern is being vigorously prosecuted. It is hoped this railway will shortly be extended to cross the Grand Trunk Pacific and reach northerly into the Peace River district. Connection is hoped to be made at some point then with the Edmonton, Dunvegan and British Columbia railway.

These railways are already augmented by local steamboat services, which serve to assist the early settlement of adjacent territories, though they do not prove sufficient means of transportation when farming operations are in full swing. Branch lines to serve the more populous agricultural settlements located beyond the convenient reach of main lines must shortly be constructed. In the meantime, the Provincial Government is building roads and bridges with all despatch, and the intending settler may rest assured that his transportation problems are receiving attention.

Homesteads in the Dominion Government Peace River Block and pre-emptions in the remainder are still available, though the best locations of such free lands are being rapidly taken up. Unimproved lands may be purchased from the British Columbia Government, at \$5 per acre for first-class and \$2.50 per acre for second-class lands. Other unimproved lands, held by investors, and in many cases including very choice areas located close to a railway, may be purchased at prices ranging from \$8 to \$15 per acre. Lands in the Terrace "Strawberry belt" sell in 10-acre blocks for as high as \$75 per acre in their raw state.

Leases for grazing purposes may be obtained on both Dominion and Provincial lands. During the past year cattlemen have been acquiring large areas of these lands and immediately placing herds of cattle thereon.

Comparatively little prairie land is available, though in the Peace and Nechako rivers and the Ootsa and François lakes districts there is much vacant land carrying but a very light and scattered tree growth.

The clearing of land in British Columbia has always been a source of discouragement to the prospective settler. In the coast and southerly parts it has been a serious problem, but this drawback exists only to a very limited degree in Central British Columbia. Though labour has been scarce and powder expensive, fields have been cleared up in remarkably short time and with surprisingly low costs. Modern machinery is doing much to reduce this task to a minimum. Moreover, the demand for prairie farms is not as insistent as it formerly was. The presence of a certain quantity of wood for fuel or building and fencing purposes is a valuable asset to the farm in these days

of high lumber cost. Where formerly the clearing of land was considered an expensive item only, it is now, if not an actual revenue producer, at least a means of obtaining these valuable and necessary requisites.

Persons of limited capital, desirous of obtaining a farm home of their own, can find no place more worthy of their consideration than Central British Columbia. Pioneering conditions offer the minimum of hardship and the prospects of rapid advancement are nowhere better. The fertile soil quickly responds to cultivation, the climate is moderate and agreeable, the district is easy of access and good markets are available. In the early years, before the settler has any production to offer for sale, a revenue may be obtained by working out if necessary during part of the seasons. The lumbering, mining and fishing industries, railroad and highway building and many kindred activities offer work at good rates of pay, by which his capital may be supplemented till his farming operations are in full swing. Wood for building and fencing purposes, or for fuel, is free and plentiful, the best of water is obtainable in plenty, and game, fish and wild fruits may be made to supplement his larder. Many of the most successful farmers of these districts have started in such humble manner.

Equally attractive inducements are held out to the settler with greater means, but particularly to the mixed or dairy farmer. The climate, water and vegetation are especially favourable to the dairy cow, and fodder in abundance is always assured. Clover and alfalfa, especially on irrigated lands, give excellent returns. The Provincial Government is now paying especial interest to the dairy industry and is assisting in the introduction of pure-bred herds and the establishment of creameries.

The various districts and their particular attraction might be briefly summarized as follows:—

Peace river—Fort St. John vicinity, ranching and mixed farming; Pouce Coupé—mixed farming; Hudson Hope—ranching and mixed farming; Finlay—mixed farming; smaller tributaries of Peace—small ranching.

Fraser river, upper part—mixed farming and truck gardening; lower part, dairy-farming and fruit and vegetable growing.

Nechako valley—dairy-farming, sheep-raising and grain and vegetable growing.

Bulkley valley—mixed farming and ranching.

Chilcotin country—ranching (now nearly overstocked), irrigated farming.

Quesnel and Horsefly country—ranching and sheep-raising.

François and Ootsa lakes districts, Stuart lake district and outlying sections of similar nature—ranching, developing into mixed and dairy-farming as roads and railroads are constructed.

Kitsumgallum-Kitimat valley—fruit and vegetable growing, poultry-raising, bee-keeping and cream production.

Skeena and Nass valleys—mixed and dairy-farming, truck and vegetable raising, fruit growing.

Bella Coola valley—fruit and vegetable growing.

These are only a few brief indications, but serve to suggest the range of possibilities for the rural settler.

The lumbering industry is well established, but the great forest stands of the coast regions and Fraser valley above Prince George give ample scope for further

expansion. The pulp and paper industry may be expected to increase. As the country settles there arise numerous opportunities for the establishment of woodworking industries, such as sash and door factories, planing mills, furniture factories and similar lines.

The mining industry has passed through various stages during the last fifty years. Primitive methods of placer mining have been followed on creeks in almost every section of the interior and fabulous sums of gold have been recovered. Small, individual operations of this nature have almost disappeared, but great undertakings, involving the construction of huge dams and long ditches and the installation of heavy machinery, have begun to supplant them. With better transportation facilities, these industries may be expected to expand, and modern dredges and hydraulic plants are likely to be found in many places throughout the Cariboo and Omineca districts.

Lode mining has developed rapidly along the coast, where great bodies of copper, silver, zinc, lead and gold-producing ore, within easy reach of coast shipping facilities, have been found. New discoveries are constantly being made. The Portland canal district is at present a favourite field for prospectors and the Mecca of western mining men. Prospecting and development is quietly going on, however, in almost every nook and corner of the interior, and many promising bodies of ore are showing up. The great quartz bodies of Mount Selwyn are receiving considerable attention. The claims worthy of careful examination are too numerous to mention.

Coal mining is yet to receive attention, but will doubtless become an important part of this industry. The possibilities of discovering oil are not to be overlooked. Extensive prospecting and drilling operations are now being prosecuted in the Pouce-Coupé district and the outlook is said to be very encouraging. The production of non-metallics and the manufacture of various clay products offer opportunities for the establishment of such industries as the local demand increases. Mining and its associated industries will play an important part in the development of Central British Columbia.

Fishing is a well-established industry on the coast, but not commercially prosecuted in the interior. Great opportunities for successful sturgeon fishing on the great interior lakes await exploitation. Whitefish might also be put to commercial advantage, as in the case of the Prairie Provinces.

Manufacturing, though as yet almost neglected, may be expected to become permanently established. The presence of such tremendous quantities of raw material, minerals and wood particularly, and the means of procuring at low cost a constant supply of cheap power from the many great water-powers of the district should be sufficient to guarantee the future of this industry. A local demand is steadily increasing and shipping facilities are being improved.

Two great allied industries, shipping and shipbuilding, appear to be coming into their own at Central British Columbia's great natural seaport, Prince Rupert. Coast-wise shipping has flourished for several years, but foreign and transpacific shipping lines are necessary to ensure the thorough development of both this port and the interior. Bottoms for the transport of lumber, pulp, paper, products of the mine and farm, fish and other resources from this province and for grain and other produce hauled from the Prairie Provinces to the Grand Trunk Pacific terminus at this port are required. Some well-established steamship lines between Prince Rupert



"Australian Ranch," on Cariboo road, twenty miles south of Quesnel.



Farm at Pouce Coupé purchased by a returned soldier.

and the principal seaports of the Pacific would do much to make this city a second Vancouver.

Shipbuilding in Prince Rupert has now obtained a foothold. The "Prince Rupert Dry Docks and Engineering Company, Limited," associated with "The Mullen Construction Company, Limited," has established modern and extensive dry-docks, capable of docking the largest ocean vessels, and a modern shipbuilding plant on the water-front, about midway between the Grand Trunk Pacific dock and Seal cove in Prince Rupert. All classes of vessels may now dock here for repairs. Machine shops capable of effecting any repairs to ocean-going or coastal boats have been created and the boon thus afforded to shipping is invaluable.

The shipbuilding programme, after some hitches, was finally got under way during the summer and fall of 1919. The first keel was laid on September 27, 1919, by His Excellency the Duke of Devonshire, Governor General of Canada. The second was laid about the first of November. Some 250 men were employed at this time with expectations of having their number doubled in a short time. These ships were designed as ocean-going vessels and the industry, it is hoped, is permanently established. The first to be completed was the *Canadian Scottish*, a unit of the Canadian Merchant Marine. She was given her speed trials on August 24, 1921, and was pronounced satisfactory. This boat bears the register of Prince Rupert and immediately went into service carrying a load of freight to Australia, thus initiating what is hoped will prove an ever-increasing ocean traffic. The second boat is to be known as the *Canadian British*.

Projects for the utilization of water in connection with irrigation, mining or the production of power are already being put forth in numerous select localities and may be expected to become very numerous. In fact, it is argued by many that the Grand Trunk Pacific might be electrified through British Columbia. This most important asset applies not only to large-scale operations but all the way down from the most extensive undertakings to the smallest. The numerous small swift streams give to the farmer an excellent opportunity to fit up a small turbine or pelton wheel by which his buildings can be lighted, his machinery run, his water pumped and his fields irrigated.

Following in the wake of agricultural and industrial advancement there arise the openings and opportunities for the usual complement of mercantile and professional lines or callings. The chance to "grow up with the country" is beckoning to many, and the future of Central British Columbia promises to be full of rich reward for those who settle in these parts of Canada.

APPENDIX I

PRE-EMPTION AND HOMESTEAD REGULATIONS

Pre-emption—Provincial Lands

Surveyed agricultural land, except timber land, to the extent of 160 acres may be pre-empted. Timber land is defined as that carrying 8,000 feet of milling timber to the acre west of the Cascades or 5,000 feet to the acre east of the Cascades. No person can hold more than one claim at a time. Claims cannot be recorded by agents. Settlers to enter occupation within sixty days from allowance of claim, occupy claims for five years and make improvements to value of \$10 per acre, including clearing and cultivating at least five acres. More than two months' continuous absence during any one year without leave is deemed cessation of occupation. No Crown grant can be issued to aliens not naturalized. The pre-emptor shall, after complying with the Act in respect to occupation and improvements, be entitled to a free grant of the land upon payment of Crown-grant fee of \$10. Pre-emptors in occupation not less than three years, who have made proportionate improvements, may, because of ill-health, or other cause, be granted intermediate certificate of improvement and transfer claims. Records without permanent residence are issued providing applicants make improvements valued at \$300 per annum; title being obtainable after five years, providing improvement is made to \$10 an acre, including clearing, and cultivating five acres, and there has been residence of at least two years. A pre-emptor holding Crown-grant may record another pre-emption if land is required in conjunction with his farm, without actual occupation, provided statutory improvements are made and residence maintained on Crown-granted land.

Grazing permits are issued based on numbers ranged, with priority for established owners, at initial rate of 5 cents per head of cattle per month, with minimum of 25 cents and maximum of 50 cents per head per season. Rate for horses 25 per cent more than for cattle; sheep and goats one-quarter of those for cattle. Free, or partially free, permits for settlers, campers and travellers; up to ten head.

Application for more detailed information should be made to the Deputy Minister of Lands, Victoria, B.C.

Homestead—Dominion Lands (Peace River Block)

All surveyed agricultural Dominion lands in the Peace River block which are not disposed of and not reserved or occupied, are open to homestead entry.

Islands are reserved from entry.

An entry does not include the mineral or water rights.

The sole head of a family, or any male over eighteen years old, who is a British subject, or declares an intention to become a British subject, may homestead one quarter-section of available Dominion land. Applicant must appear in person at the Dominion Lands Agency or Sub-Agency for the district. Entry by proxy may be made at any Dominion Lands Agency (but not Sub-Agency), on certain conditions.

An agent may reserve one available quarter-section as a homestead for a minor over seventeen years of age until he is eighteen, on certain conditions.

Application for homestead entry may be made by a person eligible under the provisions of "The Dominion Lands Act," either at the land agency for the district in which the land is situated, or at the office of a sub-agent authorized to transact business in the district.

Six months' residence upon and cultivation of the land in each of three years. A homesteader may live within nine miles of his homestead on a farm of at least eighty acres, on certain conditions. A habitable house is required, except where residence is performed in the vicinity.

The area of cultivation is subject to reduction in case of rough, scrubby or stony land. Live stock may be substituted for cultivation under certain conditions.

A homesteader is allowed six months from the date of his entry within which to perfect the same by taking possession of the land and beginning his residence duties. Any entry not so perfected within that period is liable to cancellation.

APPENDIX II

PURCHASE AND LEASE OF LANDS

Purchase of Crown Land

Applications to purchase vacant and unreserved Crown lands, surveyed or unsurveyed, for agricultural purposes, not under 40 or over 640 acres, are received, prices being \$5 per acre for first-class and \$2.50 for second-class land. First-class lands are those which can be profitably cultivated, or wild hay meadows; other lands are classified as second-class. Timber land, i.e., carrying 8,000 feet of milling timber to the acre, west of the Cascades or 5,000 feet to the east, are not open to purchase—except that mill, factory or industrial sites not exceeding 40 acres may be sold on terms and conditions fixed by the minister, conditions including payment of stumpage values in addition to royalty and taxes. Watersheds may be sold when required by incorporated cities for waterworks purposes. Foreshore, tidal lands, sea-bed lands covered by navigable waters, quarries, fishing stations or cannery sites, are disposable only by special Order in Council upon such terms and conditions as made therein.

Application to purchase surveyed lands is made to the Commissioner of the division in which they are located, stating the lot number and location, and, on the application being allowed, a deposit of 25 per cent is made, the balance payable in one, two and three years at 6 per cent, or payment may be made in full. Unsurveyed lands must be staked by applicant or agent and notice of intent to purchase advertised for two months in the *British Columbia Gazette* and a newspaper published nearest to the land (embodying particulars regarding applicant and location with reference to a known streamway or physical characteristic). Forms for applications and notices as set forth in the Land Act are provided. Application is made within three months of first publication of notice, with deposit of 50 cents per acre, to commissioner of the division in which the land is situated. Within six months of the purchase being allowed a survey must be made at purchaser's expense, and it is the duty of the surveyor to classify the land, indicating whether any part is likely to be required for townsite or fishing station, or whether granting of land would hamper development of adjoining natural resources. If the survey is not considered satisfactory the minister may order a new one. If surveyor's report discloses, or information is otherwise received, indicating a sale not in public interest, the application may be refused and deposit returned. If the surveyor's report is accepted notice to that effect is published for sixty days in the *British Columbia Gazette*, during which time any adverse claim may be filed, decision being made by the minister, and priority being established applicant is notified to complete payment. Where priority is not satisfactorily established the minister may order sale by tender to applicant bidding highest. By Order in Council surveyed lands may also be offered at public sale, upset price being not less than classified prices under the Land Act.

Permanent improvements to value not under \$5 per acre are to be made within four years, Crown grant not being issued until applicants file certificate that such

improvements are made, setting out in detail their nature and value. In event of failure to complete purchases in compliance with the Act, sales may be cancelled and payments forfeited. A second purchase may not be made until certificate is filed showing improvements valued at \$3 per acre have been made on first purchase—bona fide cultivation being deemed improvement—or Crown grant is received, of first purchase abandoned. Unless specially notified at time of sale, purchases are subject to public right of way, also private rights of way existing at time of sale, as leading or using water for animals and mining, engineering or irrigation purposes, also use, without compensation, of stone, gravel, or other material required for road repairs.

Natural hay meadows, inaccessible by existing roads, may be purchased conditional upon applicant building a satisfactory road to them; cost of road not exceeding half of amount to be rebated from purchase price.

Lease of Crown Land

Leases up to 640 acres in extent, with covenants and conditions deemed advisable, are made (a) for hay-cutting, up to 10 years; (b) for other purposes, excepting timber cutting, up to 21 years. For bona fide industrial purposes, leases exceeding 640 acres may be made. Leases of timber land for mill, factory or other industrial site, up to 40 acres, are made under conditions including payment of stumpage, in addition to rent, royalty and taxes. Leases may also be granted for grazing, industrial or quarrying purposes, including digging clay or marl, on lands held under timber lease or special timber license, under conditions deemed advisable. For home sites, leases up to 20 acres are obtainable subject to occupation and cultivation, erection of dwelling-house during first year, and payment of cost of survey collectable similarly, as rental due under lease, lessee being entitled to Crown grant on expiration of lease, if conditions and stipulations are fulfilled. Watersheds required by cities for water supply may be leased on conditions deemed advisable for periods not exceeding 999 years. Leases may be granted on lands reserved as school reserves, consent of school trustees being required where a school-house is built upon such reserve.

Unsurveyed land must be staked precedent to application for lease, by applicant or agent, and application for permission to lease made to the commissioner of the division, setting forth particulars, including staking, boundaries, location, purpose for which lease is required, also a notice with similar particulars advertised in the *British Columbia Gazette* and a newspaper published in the division, or nearest to it, for two months. Application is made within three months of first publication of notice, with statutory declaration that notice has been published. No advertisement is necessary and staking is not required in applications to lease surveyed lands. Written application is made to the Commissioner of the district, giving number, location and acreage of lot. Lessees of unsurveyed land must have survey made in accordance with regulations of Surveyor General, within six months, at their expense. If two or more applicants apply for the same tract the minister will decide as to priority, and failing to establish priority of right, he may ask applicants to tender and award right to lease to highest bidder.

Pre-emptors holding records on, or recording on lands leased, have right of way over leased lands, providing they do not commit wilful waste or damage in passing over such lands.

APPENDIX III

LAND SETTLEMENT ACT

The Land Settlement Board, which was brought into existence by the Land Settlement Act of British Columbia, have established fourteen Land Settlement Areas in Central British Columbia.

The method by which land may be obtained through the Land Settlement Board is as follows:—

A payment of not less than twenty per cent of the selling price shall be made in cash on delivery of the agreement of sale, the balance to be payable in equal yearly instalments extending over a period not exceeding fifteen years from the date of the agreement, with interest payable yearly on the unpaid balance at the rate of seven per cent per annum.

Bona fide residence of the settler in a habitable dwelling upon the land sold shall be established to the satisfaction of the board within twelve months from the date of agreement of sale, and be continued so long as any part of the selling price or interest remains unpaid.

Improvements to all cultivable lands shall be made by the settler equal in value to:—

\$0.50 per acre within two years from the date of the agreement of sale.

1.00 per acre during the third year from the date of the agreement of sale.

1.50 per acre during the fourth year from the date of the agreement of sale.

1.50 per acre during the fifth year from the date of the agreement of sale.

1.50 per acre during the sixth year from the date of the agreement of sale.

6.00 total value per acre of improvements to the land, exclusive of buildings and fences, required before title may be issued, whether payment in full of selling price has been made or not.

Where a sale of lands is made to a settler who is a returned soldier, within the meaning of section 45 of the "Land Settlement and Development Act," the selling price shall, in the case of the first purchase of land from the board by him, be abated by the deduction therefrom of the sum of five hundred dollars, and the balance remaining after such deduction shall be the selling price of the lands to the returned soldier. The amount payable in cash on delivery of the agreement of sale to a returned soldier shall be not less than ten per cent of the selling price so abated, but in all other respects the terms and conditions of sale shall be those set out above: Provided that where the returned soldier obtains from the Soldier Settlement Board of the Dominion Government, on the security of the lands sold, a loan of money for the purpose of improving or stocking the said lands for agricultural or pastoral purposes, the lands may be sold to the returned soldier at the selling price so abated, payable in cash, and without requiring from the returned soldier any observance by him of the conditions in respect of improvements set out above.

No sale of lands within either of said areas shall be made by the board to any person who by reason of his religious doctrines or otherwise is averse to bearing arms

and refuses personal military service, and therein fails to undertake the full responsibility of citizenship, or who under any law, Order in Council, or otherwise, has for like reason been exempted from military service within Canada.

Owners of lands within any of said areas who do not reside on their lands shall make and execute improvements on their cultivable lands, and maintain the improvements to the satisfaction of the board, as follows:—

- \$2.00 per acre within one year from the date of notice.
- 2.00 per acre within the second year from the date of notice.
- 2.00 per acre within the third year from the date of notice.
- 2.00 per acre within the fourth year from the date of notice.
- 2.25 per acre within the fifth year from the date of notice.
- 2.25 per acre within the sixth year from the date of notice.

\$12.50 total improvements per acre.

Pastoral lands may be stocked to the satisfaction of the board in lieu of the improvements required.

The board may at any time by exchange, subdivision, or consolidation, adjust any individual parcels of land, the title to which has been acquired by the board, into units not exceeding 640 acres in area, for the purpose of better adapting the same for use under the conditions prevailing; and where two or more parcels are consolidated into one unit, the improvements thereon may, at the discretion of the board, be made and executed on all or any one of the parcels.

Representatives of the board are to be found at Telkwa, Vanderhoof and Prince George who will show prospective purchasers around and give them all information available regarding their respective districts.

Application should be made to the Chairman of the Land Settlement Board, Victoria, B.C., for further detailed information respecting land under the control of the Land Settlement Board, or to any of the branch offices as above, or to the Government Agents at Smithers, Fort Fraser, Quesnel, and 150-Mile House.

APPENDIX IV

GOVERNMENT AID TO FARMERS

As an aid to more rapid improvement of farm lands the British Columbia Provincial Government has passed legislation providing for loans to bona fide settlers, on the security of their land.

Application for a loan is made in writing on forms supplied by the Land Settlement Board, Victoria, B.C., and the amount applied for must not be less than two hundred and fifty dollars (\$250) nor more than five thousand dollars (\$5,000) to an individual and ten thousand dollars (\$10,000) to an association.

Loans may be made for the following purposes:—

- (a) For any purpose which in the opinion of the Board will maintain or increase agricultural or pastoral production;
- (b) For carrying out the object of any association; subject to approval by Order in Council;
- (c) For taking over in whole or in part, subject to approval by Order in Council, any existing loan advanced by the Crown in right of the province, to any association, or any debentures issued by any association.

Before granting any loan the Board shall ascertain that the loan is justified on the following grounds:—

- (a) The value of the security offered, estimated on the basis of agricultural productiveness as hereinafter provided;
- (b) The desirability of the proposed loan for any of the purposes described in the last preceding section;
- (c) In the case of an individual borrower, the ability of the applicant to make a fair living for himself and his family from the farming of his land, when improved as proposed by means of the loan applied for and after having paid interest and amortization charges or other payments as required under the mortgage;
- (d) In the case of an association, that the association is solvent and has adequate earning powers, and that its records, methods, investments and management are satisfactory to the board;
- (e) That the granting of the proposed loan for the specified purpose in the opinion of the board will be of economic benefit to the borrower.

No loan will be granted exceeding sixty per cent of the appraised value of the land offered as security.

Short dated loans shall be made for a period of not less than three years and not more than ten years, either straight or amortizable; long-dated loans shall be made for a period of either fifteen, twenty or twenty-five years, repayable on the amortizable plan.

The Land Settlement Board will at all times furnish complete information regarding terms of loans, and application for desired information should be made direct to the board.

APPENDIX V

MINING REGULATIONS

Free Miner's Certificates

Any person over the age of eighteen, and any joint-stock company, may obtain a Free Miner's Certificate on payment of the required fee.

The fee to an individual for a Free Miner's Certificate is \$5 for one year. To a joint-stock company having capital of \$100,000, or less, the fee for a year is \$50; if capitalized beyond this, the fee is \$100.

The Free Miner's Certificates all expire at midnight on May 31 in each year. Certificates may be obtained for any part of a year, terminating on May 31 for a proportionately less fee.

The possession of this certificate entitles the holder to enter upon all lands of the Crown, or upon any other lands on which the right to so enter is not specially reserved, and to prospect for minerals, locate claims, and mine.

A free miner can only hold, by location, one mineral claim on the same vein or lode, but may acquire others by purchase. In the case of placer claims, only one claim can be held by location on each creek, ravine, or hill, and not more than two in the same locality, only one of which shall be a "creek" claim.

In the event of a free miner allowing his certificate to lapse, his mining property (if not Crown-granted) reverts to the Crown, but where other free miners are interested as partners or co-owners the interest of the defaulter becomes vested in the company continuing co-owners or partners pro rata, according to their interests.

It is not necessary for a shareholder, as such, in an incorporated mining company to be the holder of a Free Miner's Certificate.

Mineral Claims

Mineral claims are located and held under the provisions of the "Mineral Act."

A mineral claim is a rectangular piece of ground not exceeding 1,500 feet square. The angles must be all right angles unless the boundaries, or one of them, are the same as those of a previously recorded claim.

No special privileges are allowed for the discovery of new mineral claims or districts.

A mineral claim is located by erecting three "legal posts," which are stakes having a height of not less than 4 feet above ground and squared for 4 inches at least on each face for not less than a foot from the top. A tree-stump so cut and squared also constitutes a legal post.

The "discovery post" is placed at the point where the mineral in-place is discovered.

Nos. 1 and 2 posts are placed as near as possible on the line of the ledge or vein, shown by the discovery post, and mark the boundaries of the claim. Upon each of

these three posts must be written the name of the claim, the name of the locator, and the date of location. On No. 1 post, in addition, the following must be written: "Initial post. Direction of Post No. 2 (giving approximate compass bearing), . . . feet of this claim lie on the right, and . . . feet on the left of the line from No. 1 to No. 2 posts."

The location-line between Nos. 1 and 2 posts must be distinctly marked—in a timbered locality by blazing trees and cutting underbrush, and in bare country by monuments of earth or rock not less than 2 feet in diameter at the base, and at least 2 feet high—so that the line can be distinctly seen.

Mineral claims must be recorded in the Mining Recorder's office for the mining division in which they are situated within fifteen days from the date of location, one day extra being allowed for each ten miles of distance from the recording office after the first ten miles. If a claim is not recorded in time it is deemed abandoned and open for relocation, but if the original locator wishes to relocate he can only do so by permission of the Gold Commissioner of the district and upon the payment of a fee of \$10. This applies also to a claim abandoned for any reason whatever.

Mineral claims are, until the Crown grant is issued, held practically on a yearly lease, a condition of which is that during such year assessment-work be performed on the same to the value of at least \$100, or a payment of such sum be made to the Mining Recorder. Such assessments must be recorded before the expiration of the year, or the claim is deemed abandoned. If, however, the required assessment-work has been performed within the year, but not recorded within that time, a free miner may within thirty days thereafter, record such assessment-work upon payment of an additional fee of \$10. The actual cost of the survey of a mineral claim to an amount not exceeding \$100, may also be recorded as assessment-work. If, during any year, work is done to a greater extent than the required \$100, any further sum of \$100—but not less—may be recorded and counted as further assessments. As soon as assessment-work to the extent of \$500 is recorded, the owner of a mineral claim is entitled to a Crown grant on payment of a fee of \$25, and giving the necessary notices required by the Act. Liberal provisions are also made in the Act for obtaining mill-sites and other facilities in the way of tunnels and drains for the better working of claims.

Placer Claims

Placer-mining is governed by the "Placer-mining Act," and by the interpretation clause its scope is defined as "the mining of any natural stratum or bed of earth, gravel, or cement mined for gold or other precious minerals or stones." Placer claims are of four classes, as follows:—

"'Creek diggings': any mine in the bed of any stream or ravine;

"'Bar diggings': any mine between high and low-water marks on a river, lake, or other large body of water;

"'Dry diggings': any mine over which water never extends;

"'Precious-stone diggings': any deposit of precious stones, whether in veins, beds, or gravel deposits."

The following provisions as to extent of the various classes of claims are made by the Act:—

“In ‘creek diggings’ a claim shall be two hundred and fifty feet long, measured in the direction of the general course of the stream, and shall extend in width one thousand feet, measured from the general course of the stream five hundred feet on either side of the centre thereof;

“In ‘bar diggings’ a claim shall be:—

“(a) A piece of land not exceeding two hundred and fifty feet square on any bar which is covered at high-water; or

“(b) A strip of land two hundred and fifty feet long at high-water mark, and in width extending from high-water mark to extreme low-water mark;

“In ‘dry diggings’ a claim shall be two hundred and fifty feet square.”

The following provision is made for new discoveries of placer-mining ground:—

“If any free miner, or party of free miners, discovers a new locality for the prosecution of placer mining and such discovery be established to the satisfaction of the Gold Commissioner, placer claims of the following sizes shall be allowed to such discoverers, viz:—

“To one discoverer, one claim 600 feet in length;

“To a party of two discoverers, two claims amounting together to 1,000 feet in length;

“And to each member of a party beyond two in number, a claim of the ordinary size only.

“The width of such claims shall be the same as ordinary placer claims of the same class: Provided that where a discovery claim has been established in any locality no further discovery shall be allowed within five miles therefrom, measured along the watercourses.”

Every placer claim shall be as nearly as possible rectangular in form, and marked by four legal posts at the corners thereof, firmly fixed in the ground. On each of such posts shall be written the name of the locator, the number and date of issue thereof, if located within ten miles of the office of the Mining Recorder by the claim. In timbered localities boundary-lines of a placer claim shall be blazed so that the posts can be distinctly seen, underbrush cut, and the locator shall also erect legal posts not more than 125 feet apart on all boundary-lines. In localities where there is no timber or underbrush, monuments of earth and rock, not less than two feet high and two feet in diameter at base, may be erected in lieu of the last-mentioned legal post, but not in the case of the four legal posts marking the corners of the claim.

A placer claim must be recorded in the office of the Mining Recorder for the mining division within which the same is situate, within fifteen days after the location thereof, if located within ten miles of the office of the Mining Recorder by the most direct means of travel. One additional day shall be allowed for every ten miles additional or fraction thereof. The number of days shall be counted inclusive of the days upon which such location was made, but exclusive of the day of application for record. The application for such record shall be under oath and in the form set out in the Schedule to the Act. A claim which shall not have been recorded within the prescribed period shall be deemed to have been abandoned.

To hold a placer claim for more than one year it must be re-recorded before the expiration of the record or re-record.

A placer claim must be worked by the owner, or someone on his behalf, continuously, as far as practicable, during working hours. If work is discontinued for a period of seventy-two hours, except during the close season, lay-over, leave of absence, sickness, or for some other reason to the satisfaction of the Gold Commissioner, the claim is deemed abandoned.

Lay-overs are declared by the Gold Commissioner upon proof being given to him that the supply of water is insufficient to work the claim. Upon similar circumstances he has also the power to declare a close season by a notice in writing and published in the *Gazette*, for all or any claims in his district. Tunnel and drain licenses are also granted by him on the person applying giving securities for any damage that may arise. Grants of right of way for the construction of tunnels or drains across other claims are also granted on payment of a fee of \$25, the owner of the claim crossed having the right for tolls, etc., on the tunnel or drain which may be constructed. These tolls, however, are, so far as the amount goes, under the discretion of the Gold Commissioner.

Hydraulic and Dredging Leases

Leases of unoccupied Crown lands may be granted by the Lieutenant-Governor in Council upon recommendation of the Gold Commissioner of the district, after location, by placing a legal post at each corner of the ground applied for. On the post nearest the placer-ground then being worked the locator must post a notice stating the name of the applicant, the location of the ground to be acquired, the quantity of ground, and the term for which the lease is to be applied for. Within thirty days application must be made in writing to the Gold Commissioner, in duplicate, with a plan of the ground on the back, and the application must contain the name of each applicant, the number of each applicant's free miner's certificate, the locality of the ground, the quantity of ground, the terms of the lease desired, and the rent proposed to be paid. A sum of \$20 must accompany the application, which is returned if the application is not granted. The term of leases must not exceed twenty years. The extent of ground covered by leases is not in excess of the following: Creek, half a mile; hydraulic diggings, eighty acres; dredging leases, five miles; precious-stone diggings, ten acres. Under Order in Council, the minimum rental for creek lease is \$75 per annum and for hydraulic lease \$50 per annum, with a condition that at least \$1,000 per annum shall be spent in development. For dredging leases the usual rental is \$50 per mile per annum; development work worth \$1,000 per mile per annum must be done.

Under the "Placer-mining Act Amendment Act, 1920," section 6, the annual rental and amount to be expended annually on development-work was materially reduced on all leases issued after July 1, 1920. For details consult the Act; but the provisions may be roughly summarized as follows:—

Bench lease, annual rental, \$25; annual development-work, \$250.

Creek lease, annual rental, \$37.50; annual development-work, \$250.

Dredging lease, annual rental per mile, \$25; annual development-work, per mile, \$1,000.

It was further enacted that all development-work must be recorded with Mining Recorder during the current year, similarly as is done with a mineral claim, and in default of such record being made the lease becomes automatically forfeited.

Excess work may be recorded three years in advance. Payment in cash of like amount to the development requirements may be made in lieu of such development-work.

Under section 7 of said Act, any lease issued prior to the passing of this Act, in which the rentals and development requirements are higher, such lease, if in good standing, may, by application to the Gold Commissioner, be brought under the terms and conditions of this Amendment Act.

Coal and Petroleum Prospecting Licenses

Any person desiring to prospect for coal, petroleum or natural gas upon any unreserved lands held by the Crown may acquire license to do so over a rectangular block of land not exceeding 640 acres, of which the boundaries shall run due north and south and east and west, and no side shall exceed 80 chains (one mile) in length. Before entering into possession of the said land he shall place at the corner of such block a legal stake, or initial post, and shall inscribe thereon his name and the angle represented by such post, thus: "A.B.'s N.E. corner," or as the case may be, and shall keep posted for thirty days in a conspicuous place upon the said land, and also in the Government office of the district, as well as publishing it in the *British Columbia Gazette* and in a local newspaper for a like period, a notice of his intention to apply for such prospecting license.

The applications for said license shall be in writing, in duplicate, and shall contain the best written description possible, with a diagram of the land sought to be acquired, and shall be accompanied with a fee of \$100. The application shall be made to the Commissioner of Lands for the district, and by him forwarded to the Minister of Lands, who shall grant such license—provided no valid protest is substantiated—for a period not to exceed one year, and at the expiration of the first year an extension of such license may be granted for a second or third year.

Should the licensee discover coal, petroleum, or natural gas upon such land during the period of his license, and produce satisfactory evidence, under oath, of the fact, he may obtain from the Lieutenant-Governor in Council, after having had the land properly surveyed, a lease of the said block for a term of five years, at an annual rental of 15 cents an acre, and such lease may be renewed for a further period of three years, upon the payment of a renewal fee of \$100 for each parcel of 640 acres of land; and if during the term of such lease, or within three months thereafter, he can show conclusively that he has continuously and vigorously prosecuted the work of coal or petroleum mining, and has fully carried out the terms of such lease, he shall be entitled to purchase the said lands, including the coal, petroleum, or natural gas thereunder, at the rate of \$20 an acre, or in the event of the surface rights having been alienated from the Government, he can purchase the coal, petroleum, or natural gas underlying such lands at the rate of \$15 an acre: Provided also that, in addition to the rental or purchase price, there shall be paid to the Government as a royalty $2\frac{1}{2}$ cents a barrel (35 imperial gallons) of crude petroleum raised or gotten from such land.

APPENDIX VI

TIMBER AND FOREST FIRE REGULATIONS

How to Obtain a "Timber Sale"

Upon application being made to the Chief Forester, Victoria, or the local District Forester, any desired area of Crown timber will be cruised, surveyed (if necessary), and advertised for sale by tender. The period required for advertisement is as follows:—

- (1) Over five million feet B.M., two months.
- (2) One to five million feet B.M., one month.
- (3) Less than one million feet B.M., one to four weeks.
- (4) Should the stumpage value to the Crown be less than \$100, the local District Forester may make a sale without advertisement.

During the period of advertisement all intending purchasers are furnished with full particulars of the sale, including blue-prints showing the location and area, description and estimate of timber, upset price (which is the lowest tender that will be considered), copy of the sale contract, and tender forms.

The tender must be accompanied by a certified cheque, negotiable at par by the Department in Victoria, or by cash, including the following items:—

- (1) Cost of advertising.
- (2) Cost of cruising and survey (if any).
- (3) Annual rental (approximately 22 cents per acre on coast, and 16 cents per acre in interior).
- (4) Forest protection tax (at $2\frac{1}{2}$ cents per acre).
- (5) Deposit of 10 per cent of the stumpage price tendered, which will be dealt with as follows:—
 - (a) Returned forthwith if tender is not accepted.
 - (b) Held in trust to be returned upon the satisfactory completion of the contract.
 - (c) Forfeited to the Crown if the contract is not completed to the satisfaction of the Minister.

Each sale contract specifies the period within which operations are required to be completed. Should any timber remain uncut at the date of expiration, application may be made in the regular way for a new sale to cover the unlogged area.

Timber-sale contracts are not transferable.

The provision permitting the District Forester to make small sales under \$100 without advertisement should be of special interest to small operators and hand-loggers, as sales can in this way be put through with the least possible delay and expense.

Small sales also have a distinct advantage over hand-loggers' licenses, inasmuch as they are not of a personal nature and have no restrictions as to the logging equipment used, or the number of men employed.

Application for further information should be made to the Chief Forester, Victoria, B.C.

Extracts from the "Forest Act"

106. The period from the first day of May to the first day of October in each year shall be known as the close season in respect to the setting of fire; but when circumstances of unusual danger render it necessary in the public interest, the Lieutenant-Governor in Council may, by Proclamation, extend the said season.

107. During the close season it shall be unlawful for any person to set out, or cause to be set out, started, or kindled, any fire in or within one-half mile from any forests or woodlands except for the purpose of clearing land, cooking, obtaining necessary warmth, or for some necessary industrial purpose permitted by the Minister, and unless the obligations and precautions imposed in the following sections shall be observed.

108. During the close season no person, firm, or corporation shall set out, or cause to be set out, fires in or within one-half mile from slashings or forest debris, standing or fallen timber, or bush land for the purpose of burning slashings, brush, grass, or other inflammable material, or for any industrial purpose, without first obtaining a permit therefor: Provided that no person shall be convicted who shall have set in good faith and with reasonable care a back-fire for the purpose of stopping the progress of a fire then actually burning.

111. Every person who, during the close season, uses any explosives, or throws or drops any burning match, ashes of a pipe, lighted cigarette or cigar, or any other burning substance, in or on any forest or brush land, or at a distance of less than one-half of a mile therefrom, shall, before leaving the spot, completely extinguish the fire of the match, ashes of a pipe, lighted cigarette or cigar, or other burning substance, or explosive, and any fire caused thereby; and every such person shall be liable for all expenses incurred by the department in controlling or extinguishing any fire so caused, and the Minister shall have a right of action against such person therefor as for a debt due to the Crown.

APPENDIX VII

SUMMARY OF WATER RIGHTS

The province has been divided into thirty-one "Water Recording Districts," the boundaries of which follow as nearly as possible the main watersheds, and a "Local Recorder," in most cases the Government agent, appointed for each district. The Local Recorder acts as a "Recorder," the active administration in the more important districts being in the hands of a "District Engineer," whose duties are defined by the "Water Act, 1914," and who is subject to the Comptroller of Water Rights, whose office is at Victoria, B.C., and in whom alone is vested the power to approve an application and grant a license. The printed forms of notice, application, etc., may be obtained on application to the office of any Water Recorder, District Engineer, or to the Comptroller's office.

Licenses may be granted for the use of water for any of the following purposes: Domestic, water-works, mineral trading, irrigation, mining, steam, fluming, hydraulicking, industrial, power, clearing streams, storage, conveying, and lowering water.

As the water may be required in varying quantities, the applications have been classified as follows: "Class A," "Class B," and "Class C," the definitions of these classes being as follows:—

"Class A," in reference to any application or license, means any application of license for "domestic," "mineral trading," "steam purpose," or for "mining," or "industrial purpose" where the water is to be used in quantities not exceeding 100,000 gallons per day; or for "irrigation purpose" where the acreage to be irrigated does not exceed 640 acres; or for "power purpose" where the power to be developed does not exceed 100 horse-power and is to be used by the application only; Provided that, if in the opinion of the Comptroller the nature of the works intended is such as to require the submission of detail plans, he may place any application which might come within the foregoing classification into "Class B," notwithstanding the foregoing limitations.

"Class B," in reference to any application or license, means an application of license for "mining" or "industrial purpose" where the water is to be used in quantities exceeding 100,000 gallons per day; for "irrigation purpose" where the acreage to be irrigated exceeds 640 acres; or for "storage purpose" or "hydraulicking purpose" or "clearing streams purpose," or "fluming purpose" where the water is to be used by the applicant only; or for "power purpose" where the power to be developed exceeds 100 horse-power and is to be used by the applicant only; or for "lowering water purpose"; Provided that, if in the opinion of the Comptroller the nature of the works is such as not to require the submission of detail plans, he may place any application or license which might come within the above classification into "Class A" notwithstanding the foregoing limitations.

"Class C," in reference to any application or license, means a license by virtue of which water is held in gross, whether by special statute or otherwise; or an application or license for "power," "hydraulicking," "clearing streams," or "fluming purposes" where tolls are to be charged; or for "water-works" or "conveying purposes."

A license in respect of a "Class A" or "Class B" application can be obtained by an "owner," "owner" being defined by the Act as:—

(a) Any registered owner in the book of indefeasible or absolute fees in any Land Registry office in the province;

(b) Any purchaser or lessee in a registered agreement for purchase or lease;

(c) Any applicant to register his title as owner or his agreement for purchase or lease;

(d) Any pre-emptor, homesteader, or purchaser from the Crown in the right of either the Dominion or the province, or any applicant to so pre-empt, homestead, or purchase;

(e) Any timber licensee or lessee;

(f) Any other lawful occupant of land or of a mine;

(g) Any legal representative of an owner (as herein defined) who has died, become insolvent, is a minor, is of unsound mind, or is otherwise under disability;

(h) Any receiver or liquidator of a company which is the owner (as herein defined) of land.

A license in respect of a "Class C" application can be acquired by any municipality, company, association or body corporate whose undertaking in respect of such license has been approved under the "Water Act, 1914."

The initial procedure to obtain a "Class A" or "Class B" water license is as follows:—

(1) Post notices at or near the point of diversion and place of use;

(2) File the notice in duplicate in the office of the Water Recorder for the district in which the proposed point of diversion is situate;

(3) At the same time as filing serve the notice upon each owner whose land will be touched or in any way affected by the proposed works;

(4) Forthwith after posting on the ground, advertise the notice in a local newspaper once a week for four weeks;

(5) Within ten days after the date of the first publication, file the formal application in duplicate in the Water Recorder's office.

Application for further detailed information should be made to the local recorder or to the Water Rights Branch, Department of Lands, Victoria, B.C.

APPENDIX VIII

GAME REGULATIONS

The "open season" is declared from year to year by the Lieutenant-Governor in Council. Write the Attorney General's Department, Victoria, B.C., for a copy of the regulations for the current year.

Non-resident Hunting and Fishing Licenses

(1) *Big Game Licenses*.—To carry firearms and fishing tackle and to hunt big game and game birds, and to angle for fish, fee \$25. With additional fees for game killed as follows:—

Each moose	\$25 00
" wapiti	25 00
" cariboo	25 00
" mountain-sheep	25 00
" grizzly bear	25 00
" mountain-goat	15 00
" mule-deer	15 00
" black or brown bear	15 00
" deer or any other species	5 00

(Holder must bona fide enter the province for the purpose of hunting big game to obtain above license, and may carry his firearms without license whilst in a public conveyance.)

(2) *Spring Bear License*.—To carry firearms and to hunt bear only between January 1 and July 1, fee \$25.

N.B.—A permit to export trophies is required and can be obtained from the Provincial Game Warden or the nearest Government agent.

(3) *Angler's License*.—To carry fishing rods and to fish between March 25 and November 15, for whole season, fee \$5; per day, \$1.

N.B.—Trout over 8 inches in length only may be taken.

(4) *Game Bird License*.—(British subjects residing elsewhere in Canada)—to carry firearms and to hunt game birds only, fee \$5 per week.

Resident Hunting Licenses

(1) To carry firearms and to hunt game birds and deer, fee \$2.50.

N.B.—This license may be obtained free by a farmer or any member of his family in respect to hunting on his own land.

(2) To carry firearms and to hunt big game and game birds, \$25.

(3) To carry firearms and traps and to hunt big game and game birds and to trap fur-bearing animals, fee \$10.

N.B.—A prospector who is resident, upon production of his free miner's certificate, may obtain a free license to carry firearms and to hunt game within certain limitations for his own needs.

Bag Limit (For One Season)

Big Game—One moose; one wapiti; two cariboo; three mountain-sheep, but not more than two of one species; two mountain-goat; four deer, but not more than three of any one species.

Game Birds—Daily bag limits are declared annually by Order in Council when open seasons are fixed.

NOTE.—No person may kill at any time the females or young of moose, wapiti, cariboo, mountain sheep, or mountain goat.

It is illegal at any time to—

Use an automatic shotgun.

Use a pump-gun without a permanent plug limiting it to one shell in the magazine.

Hunt game birds from any sail or power boat in tidal waters.

Hunt in any game reserve.

Carry firearms in an automobile without a permit during any close season.

Go out with any person acting as a guide without seeing that he holds a guide's license.

Offer for sale or attempt to buy the heads of moose, wapiti, cariboo, or mountain-sheep.

N.B.—This does not apply to imported heads which have been branded by the department.

Guides

Every person who takes any other person out hunting big game and receives remuneration must hold a guide's license, fee \$5.

N.B.—Guides must return their licenses fourteen days after expiry and report the names of persons taken out and particulars of animals killed.

Fur Traders and Taxidermists

- (1) Resident fur trader's license, \$25 per year.
- (2) Non-resident fur trader's license, \$200 per year.
- (3) Taxidermist's license, \$5 per year.

APPENDIX IX

CUSTOMS AND FREIGHT REGULATIONS

(Compiled for the Information of Intending Settlers)

Customs Regulations

A settler may bring into Canada, free of duty, live stock for the farm on the following basis, if he has actually owned such live stock abroad for at least six months before his removal to Canada, and has brought them into Canada within one year after his arrival, viz: If horses only are brought in, 16 allowed; if cattle are brought in, 16 allowed; if sheep are brought in, 160 allowed; if swine are brought in, 160 allowed. If horses, cattle, sheep and swine are brought in together, or part of each, the proportions as above are to be observed.

Duty is to be paid on live stock in excess of the number for which provision is made as above. For customs entry purposes a mare with a colt under six months' old is to be reckoned as one animal; a cow with a calf six months old is also to be reckoned as one animal. Cattle and other live stock imported into Canada are subject to quarantine regulations.

The following articles have free entry:—

Settlers' effects, free, viz: Wearing apparel, household furniture, books, implements and tools of trade, occupation or employment; guns, musical instruments, domestic sewing machines, typewriters, live stock, bicycles, vehicles (including automobiles, implements moved by mechanical power, machinery used for agricultural purposes), tractors (new), valued at \$1,400 or less, as well as parts thereof for repairs, and agricultural implements in use by the settler for at least six months before his removal to Canada, not to include machinery or articles imported for use in any manufacturing establishment or for sale; also books, pictures, family plate, furniture, personal effects and heirlooms left by bequest, provided that any dutiable articles entered as settlers' effects may not be so entered unless brought with the settler on his first arrival, and shall not be sold or otherwise disposed of without payment of duty until after twelve months' actual use in Canada.

A settler may be required to take oath that all of the articles have been owned by himself or herself for at least six months before removal to Canada; that none have been imported as merchandise, for use in a manufacturing establishment or as a contractor's outfit, or for sale; that he or she intends becoming a permanent settler within the Dominion of Canada and that the live stock enumerated is intended for his or her own use on the farm which he or she is about to occupy (or cultivate), and not for sale or speculative purposes nor for the use of any other person or persons. Machines, vehicles and implements for agricultural purposes, moved by mechanical power, are only entitled to free entry as settler's effects when the settler is locating on a farm for agricultural purposes.

Freight Regulations

1. Carload shipments of farm settlers' effects must consist of the following described property of an actual farm settler, when shipped by and consigned to the same person.

Household goods and personal effects, all second-hand, and may include: Agricultural implements and farm vehicles, all second-hand (will not include automobiles).

Live stock not exceeding a total of ten head, consisting of horses, mules, cows, heifers, calves, oxen, sheep, or hogs (from Eastern Canada not more than six head of horses and mules may be included in a car of farm settlers' effects).

Lumber and shingles (pine, hemlock, spruce, or basswood), which must not exceed 2,500 feet in all, or the equivalent thereof, or in lieu of (not in addition to) the lumber and shingles, a portable house, knocked down, may be shipped.

Seed grain, trees, or shrubbery. The quantity of seed grain must not exceed the following weight: Wheat, 4,500 pounds; oats, 3,400 pounds; barley, 4,800 pounds; flax seed, 400 pounds. From points in Western States, 1,400 pounds of seed corn may also be included.

Live poultry (small lots only).

Feed, sufficient for feeding the live stock while on the journey.

2. Live Stock.—Should a settler wish to ship more than ten head of live stock (as per Rule 1) in a car, the additional animals will be charged for at the less-than-carload live stock rate (at estimated weights as per Canadian Freight Classification), but the total charge for the car will not exceed the rate of a straight carload of live stock.

When live stock forms part of the shipment, the usual live stock form of contract must be signed. Shipper must show on the live stock contract the numbers of head of each kind of stock loaded in car. Agents will require attendants to affix their signature in blank space provided for same on face of live stock contract.

3. Passes.—One man will be passed free in charge of full carloads of settlers' effects containing live stock, to feed, water, and care for them in transit, subject to conditions specified in the Canadian Freight Classification. No reduced return transportation will be given.

4. Top Loads.—Agents do not permit, under any circumstances, any article to be loaded on the top of box or stock cars; such manner of loading is dangerous and absolutely forbidden.

5. Settlers' effects, to be entitled to the carload rates, cannot be stopped at any point short of destination for the purpose of unloading part. The entire carload must go through to the station to which originally consigned.

6. The carload rates on farm settlers' effects are based on minimum weight per car, of:—

From points north of St. Paul or Duluth	24,000 pounds.
North of Chicago, Kansas City, of Omaha to	
Duluth or St. Paul	20,000 “
South and east of Chicago	12,000 “

Additional weight will be charged at proportionate rate.

From points south and east of Chicago only five horses or head of live stock are allowed in any one carload. Any number over five will be charged extra.

APPENDIX X

TAXATION

Taxation outside all incorporated cities, towns and municipalities is imposed and collected directly by the Provincial Government and expended in public improvements such as roads, trails, wharves and bridges, in assisting and maintaining the schools and in the administration of justice.

The rates of taxation imposed by the latest "Taxation Act" are as follows:—

	Per cent.
Real property.	1
Personal property.	1
Wild land.	5
Coal land, Class A.	1
" " " B.	4
Timber land.	3
Income, Class A, up to and including \$2,000.	1
" " B, exceeds \$2,000 and does not exceed \$3,000	1½
" " C, " 3,000 " " " 4,000	2
" " D, " 4,000 " " " 7,000	4
" " E, " 7,000 " " " 10,000	5
" " F, " 10,000 " " " 20,000	7½
" " G, " 20,000	10

School taxes are assessed on property situated within the various school districts throughout the province, at a rate determined by the amount of the annual requisition of funds from the school trustees.

Mining companies (other than coal or gold-mining companies) are taxed 2 per cent on the gross value of the ore at the mine, less cost of transportation and treatment, or on their income, whichever yields the greatest tax.

Coal and coke companies are taxed 10 cents per ton on all coal shipped from the mine and 10 cents per ton on all coke, or on their income, whichever yields the greatest tax.

Gold-mining companies holding gold mines, of which the market value of the gold recovered is 85 per cent or over of the metal contents of the ore therefrom, are taxed on their income.

Iron ore, other than that used as flux in the smelting of other metal ores, in addition to the above, is taxed 37½ cents per ton of 2,000 pounds.

Unworked Crown-granted mineral claims are taxed 25 cents per acre.

The following exemptions from taxation are granted:—

Personal property on any farm, orchard, or ranch, as consists of live stock, agricultural machinery, and vehicles, up to the value of \$1,000.

Improvements on farm lands up to \$1,500.

All incomes up to \$1,200 in the case of single persons or \$1,500 in the case of married persons with an additional exemption of \$200 for each dependent.

War stocks or bonds and mortgages exempt as personal property only.

Unpaid purchase-money of land as personal property.

Household furniture and effects in dwelling-houses.

Money deposited in bank, minerals, matte, or bullion in the course of treatment, timber and coal lands under lease or license from the Crown, and so much of the personal property as is represented by timber cut upon or from lands held by the lessee or license under timber leaseholds or timber licenses issued under the "Land Act," upon which timber so cut the rental, royalty, and license fees payable under the said Act have been paid, and not otherwise; and so much of the personal property of every person as is represented by timber cut from lands within this province other than lands belonging to the Crown, upon which timber so cut the tax payable under the "Land Act" has been paid, and not otherwise; but these exemptions shall not extend to the personal property of any other person who may purchase or acquire timber so cut as aforesaid or any interest therein.

Pre-emptions and homesteads for two years from date of record and an exemption of \$500 for four years more. Members of the Allied Forces who have taken up pre-emptions or homesteads since June 26, 1918, are entitled to a period of five years' exemption from taxation.

Federal Income Taxes—In addition to the provincial income tax, there is an income tax imposed by the Dominion throughout Canada. Under the Federal tax exemptions of \$1,000 in the case of unmarried persons and \$2,000 for married persons is allowed, with an additional allowance of \$200 for each child under 18 years of age.

BIBLIOGRAPHY

- Admiralty, Lords Commissioners of the.—“The British Columbia Pilot.” Hydrographic Office, Admiralty, London, 1905.
- Ami, Henry M., M.A., D.Sc., F.R.G.S., F.R.S.C.—“Canada and Newfoundland.” Chap. XVII. “British Columbia.”—Stanford’s Compendium of Geography and Travel. North America. Vol. I. London, Edward Stanford, Ltd., 1915.
- Audet, F. J.—“Canadian Historical Dates and Events, 1492-1915.” Ottawa, 1917.
- Begg, Alexander.—“History of British Columbia from its earliest discovery to the present time.” Wm. Briggs, Toronto, 1894.
- Camsell, Chas., B.Sc.—“Explorations in the Northern Interior of British Columbia.” Summary Report, Geological Survey of Canada, page 70, Ottawa, 1915.
- Camsell, Chas., B.Sc.—“Platinum Investigations in British Columbia.” Summary Report, Geological Survey of Canada, Part B, Ottawa, 1918.
- Coats, R. H., and Gosnel, R. E.—“Sir James Douglas.” Morang & Co., Ltd., Toronto, 1908.
- Cole, L. H., B.Sc.—“The Salt Deposits of Canada and the Salt Industry.” Mines Branch, Department of Mines, Ottawa, 1915.
- Conway, G. R. G., C.E.—“Water Powers of British Columbia.” Contained in “Water Powers of Canada,” Water Resources Paper No. 16, Dominion Water Power Branch, Department of the Interior, Ottawa, 1916.
- Clothier, Geo. A., B.Sc.—(Resident Engineer) “Report, Northwestern District, B.C.” Annual reports Minister of Mines, Victoria, B.C.
- Denis, Leo G., B.Sc., E.E.—“Electric Generation and Distribution in Canada.” Commission of Conservation, Ottawa, 1918.
- Department of Agriculture, Victoria, B.C.—
Pamphlets:
 “Land Settlement Board of British Columbia.”
 “Maps of Land Settlement Areas.”
- Department of Lands, Victoria, B.C.—
Pamphlets:
 “Fort George Land Recording Division.”
 “Fort Fraser Land Recording Division.”
 “Cariboo Land Recording Division.”
 “Peace River Land Recording Division.”
 “Skeena Land Recording Division.”
 “Lands for Pre-emption. South Fork of Fraser River and Canoe River Valleys.”
- Bulletins:
 Nos. 1, 2, 3, 4, 10, 11, 12, 22, 23, 25, 26, 28, 29, 30, 34, 35 and 36. (Leaflets containing detail information of various selected localities in Central British Columbia.)
- Department of Public Works, Ottawa—
 Annual Reports of “The Government Telegraph Service.”
- Dominions Royal Commission—Royal Commission on the Natural Resources, Trade, and Legislation of certain portions of His Majesty’s Dominions. “Minutes of Evidence taken in British Columbia,” London, 1917.
- Dowling, D. B., B.Sc., F.R.S.C.—“Coal Fields of British Columbia.” A compilation of numerous reports relating to the coal deposits of this province. Geological Survey, Memoir 69, Ottawa, 1915.
- Dresser, J. A., and Spieker, E. M.—“Report of Oil Surveys in the Peace River District, 1920,” Dept. of Lands, Victoria, B.C.
- Galloway, J. D., M.Sc. (Resident Engineer).—“Report Northeastern District, B.C.” Annual Reports Minister of Mines, Victoria, B.C.
- Grand Trunk Pacific Railway.—Pamphlet with map. “Plateau and Valley Lands—Central British Columbia; general information for the intending settler.” Industrial and Colonization Department, G.T.P. Railway, 8th Edition, Winnipeg, Man., 1919
- Grant, W. L., M.A.—“History of Canada,” Toronto, 1914.
- Gosnel, R. E.—“Year Book of British Columbia and Manual of Provincial Information.” (Coronation Edition) Victoria, 1911.

- Gwillim, J. C.—“Report of Oil Survey in the Peace River District, 1919.” Dept. of Lands, Victoria, B.C.
- Harmon, D. W.—“A Journal of Voyage and Travel in the Interior of North America.” Andover, 1820.
- Horetzky, Charles.—“Canada on the Pacific.” Montreal, 1874.
- Hornaday, W. T.—“The American Natural History.” C. Scribner’s Sons, New York, 1904.
- Hydrographic Office, Washington.—“Pilot Guides—The Coast of British Columbia.” Government Printing Office, Washington, 1901.
- Johnston, J. T., C.E.—“Central Electric Stations in Canada,” Part II Directory. Water Resources Paper No. 27, Dominion Water Power Branch, Department of the Interior, Ottawa, 1919.
- King’s Printer, Victoria, B.C.—
Annual Reports:
 (a) Minister of Mines,
 (b) Minister of Lands,
 (c) Department of Agriculture,
 (d) Department of Railways,
 (e) Department of Public Works,
 (f) Superintendent of Education,
 (g) Commissioner of Fisheries,
 (h) Game Conservation Board.
- Pamphlets:
 “British Columbia: The Mineral Province of Canada.” 1921.
 “Handbook of British Columbia: History, Topography, Climate, Resources.” 1921.
 “Agriculture in British Columbia.” 1921.
 “Game of British Columbia: Animals, Birds, Fishes.” 1919.
- Laut, Agnes C.—“Pioneers of the Pacific Coast.” (Volume 22, The Chronicles of Canada.)
- Laut, Agnes C.—“The Cariboo Trail.” (Volume 23, The Chronicles of Canada.)
- MacKay, B. R., B.Sc.—“Cariboo Gold Fields,” Summary Report, Part B, Geological Survey, Ottawa, 1918.
- Mackenzie, Alexander.—“Voyage from Montreal, on the River St. Lawrence, through the Continent of North America, to the Frozen and Pacific Oceans, in the years 1789 and 1793. With a preliminary account of the rise, progress and present state of the Fur Trade of that country.” London, 1801.
- MacKenzie, J. D., B.Sc.—“Telkwa Valley and Vicinity.” Summary Report, Geological Survey, Ottawa, 1915.
- Macoun, J., M.A., F.L.S., F.R.S.C.—“The Forests of Canada and Their Distribution.” 1895.
- Macoun, J., M.A., etc., and Jas. M., C.M.G., F.L.S.—“Catalogue of Canadian Birds,” Geological Survey, Ottawa, 1909.
- Masson, L. R.—“Les Bourgeois de la Compagnie du Nord-Ouest,” in 2 volumes. Volume I contains the Journal of Simon Fraser’s descent of the Fraser river in 1808. Quebec, 1890.
- McConnell, R. G., B.A., F.R.S.C., F.G.S.A.—“Report on an Exploration of the Finlay and Omineca rivers.” Section C, Annual Report (New Series), Vol. VII, Geological Survey, Ottawa, 1914.
- McLiesh, J., B.A.—“Mineral Production of Canada.” Annual. Mines Branch, Department of Mines, Ottawa.
- Meteorological Service of Canada—Monthly and Annual Reports.
- Morice, Rev. A. G., O.M.I.—“The History of the Northern Interior of British Columbia, formerly New Caledonia, 1660-1880.” Wm. Briggs, Toronto, 1904.
- Norton, B. R., B.Sc., and Lewis, R. G., B.Sc. F.—“Native Trees of Canada.” Bulletin No. 61, Forestry Branch, Department of Interior, Ottawa, 1917.
- O’Neill, J. J., M.Sc., Ph.D.—“The Platinum Situation in Canada, 1918.” Summary Report, 1918, Geological Survey, Ottawa, 1918.
- O’Neill, J. J., M.Sc., etc.—“Economic Geology of the Hazelton District, B.C.” Summary Report, Part B, Geological Survey, Ottawa, 1917.
- O’Neill, J. J., M.Sc., etc.—“Economic Geology of Salmon River District, Portland Canal.” Summary Report, Geological Survey, Ottawa, 1919.

- Parks, W. A., B.A., Ph.D.—“Report on the Building and Ornamental Stones of Canada,” in 5 volumes. Volume V relates to British Columbia, Mines Branch, Department of Mines, Ottawa, 1917.
- Prebble, Edw. A.—“North American Fauna—Serial No. 27.” Washington.
- Reinecke, L., M.A., Ph.D.—“Mineral Deposits in the neighbourhood of the Pacific Great Eastern Railway between Lillooet and Prince George.” Summary Report, Geological Survey, Ottawa, 1919.
- Scholefield, E. O. S.—“British Columbia from the Earliest Times to the Present.” In 4 volumes. Volumes 1 and 2 historical. Volumes 3 and 4 biographical, Vancouver, 1914.
- Short, A., C.M.G., M.A., LL.D., F.R.S.C., and Doughty, A., C.M.G.—“Canada and its Provinces,” in 22 volumes and index. Volumes 21 and 22—“Pacific Province.” Toronto, 1914.
- Simpson, Sir George.—“Narrative of a Journey round the World during the years 1841 and 1842.” London, 1847.
- Skelton, O. D., M.A., Ph.D.—“The Railway Builders.” (Volume 32, The Chronicles of Canada.)
- Spence, H. S., M.E.—“Mica: its occurrence, exploitation and uses.” Publication No. 118, Mines Branch, Department of Mines, Ottawa, 1912.
- Sterns, R. W., B.Sc.—“Canadian Douglas Fir,—its Mechanical and Physical Properties.” Bulletin No. 60, Forestry Branch, Department of Interior, Ottawa, 1918.
- Swan, R. G., B.A.Sc.—“British Columbia Hydrographic Survey.” For years 1913 to 1918, comprising Water Resources Papers Nos. 8, 14, 18, 21 and 23, Dominion Water Power Branch, Department of the Interior, Ottawa, 1915-17-18-19.
- Talbot, Frederick A.—“The Making of a Great Canadian Railway.” London, 1912.
- Tyrrell, J. B., C.E., M.A., F.G.S.—“David Thompson’s Narrative of His Explorations in Western America, 1781-1812.” Champlain Society, Toronto, 1916.
- University of British Columbia.—“Calendar.”
- Walbran, Capt. John T.—“British Columbia Coast Names, 1592-1906, their origin and history.” Ottawa, 1909.
- White, Arthur V.—“Water Powers of British Columbia.” Commission of Conservation, Ottawa, 1919.
- White, James, F.R.G.S., F.R.S.C.—“Dictionary of Altitudes in the Dominion of Canada.” Commission of Conservation, Ottawa, 1916.
- Whitford, H. N., Ph.D., and Craig, R. D., F.E.—“Forests of British Columbia.” Commission of Conservation, Ottawa, 1918.
- Wilson, Beckles.—“The Great Company.” The Copp Clarke Co., Ltd., Toronto, 1899.
- Wrong, Geo. M., M.A., and Langton, H. H., M.A.—“Chronicles of Canada,” in 32 volumes. Volume 22—“Pioneers of the Pacific Coast.”
Volume 23—“The Cariboo Trail.”
Volume 32—“The Railway Builders.” Glasgow, Brook & Company, Toronto.



Department of the Interior
Canada

HON. CHARLES STEWART, MINISTER
W. CORY, C.M.G., DEPUTY MINISTER

MAP OF CENTRAL BRITISH COLUMBIA

Scale 35 miles to 1 inch

Prepared in the
Natural Resources Intelligence Branch
under the
direction of F.C. Lynch, Superintendent

LEGEND

Resources indicated thus:
Minerals: stage of development in a
square:
Upper square: discovered
Lower square: in operation
More important in currencies
Oil: orange

Fuel: white
Biomass: red
Non-Agricultural
Forests: green
Pulp and Paper Mills:
black
Banks: orange
In a shaded water: power 1000 HP and over
1 inch on legend
Land: surrounding divisions



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